because of the slipping of the patella in one knee, which had but just developed.

The girl was growing rapidly and all of the structures lacked tone. The knees were relaxed and the feet also, so that there was marked pronation. This feature was corrected, the knee bandaged and a course of general tonic treatment with exercise advised.

For a time there was marked improvement following the treatment, but of late the slipping has recurred frequently, so that the patient has asked to have the operation performed and is simply awaiting a suitable time.

In considering such a series of cases it is at once obvious that the number is too small from which any positive conclusions can be drawn. At the same time there are certain features which are suggestive for application in the treatment of other cases. In the first place the lesion seems peculiar to girls or young women. It develops at the period of rapid growth, from twelve to sixteen years of age. It may develop either with or without violence. It is usually associated with flat foot, which is probably a factor in the development of the weakness of the knees. True knock knee is sometimes present. In all of the cases the tubercle of the tibia was displaced farther to the outside than normal, so that the line of pull of the quadriceps muscle contained a distinct angle. In the extreme cases without treatment the dislocation may become permanent, as in Case I.

It seems probable that if the condition is seen in the beginning, and the flat foot corrected, together with such treatment as would tend to improve the general tone, that the trouble can be corrected without operation. This has not been possible in any of the cases seen by me, but on general reasoning it seems probable.

If, on the other hand, the dislocation has recurred several times, and the period of osseous growth has passed, the weakness will probably increase unless the faulty mechanical features are corrected by operation.

If an operation is to be considered, the chief point to be borne in mind is the straightening of the line of the pull of the anterior thigh muscles. This is best accomplished by transplanting the outer half of the patella tendon so that it is attached well to the inside of the tubercle of the tibia. If the tendon be too long it can be shortened at the same time the attachment is made. The relaxed capsule is undoubtedly a result of the mechanical pull and can be entirely ignored, the relaxation disappearing as the strain is removed. Of the cases treated, seven were operated upon, and two of the others are awaiting operation. Of the operated cases, four had the outer half of the patella tendon, and one had the entire tendon, transplanted to the inside, and as three had both knees treated, there were eight operations, with normally strong joints in seven, the ultimate result in the eighth being uncertain, as sufficient time has not elapsed since the operation. Of the three cases in which other operations were performed, in one with both knees the capsule was quilted, in one

the patella tendon was shortened, without transplantation as well as quilting the capsule, and in one the inner half of the tendon was transplanted as well as quilting the capsule; all relapsed. In one of these a second operation with the transplantation of the outer half of the tendon was performed with a perfect result. In both of the other cases I am very sure that if another operation could be performed, and the tendon transplanted as has been described, the mechanical feature which makes the dislocation possible would be removed so that the slipping would cease.

SCIENTIFIC ASPECTS OF MODERATE DRINKING.

BY FRANCIS GANO BENEDICT, PH.D., MIDDLETOWN, CONN.,

Associate Professor of Chemistry, Wesleyan University.

THE relation of the drinking of alcoholic beverages to the health and welfare of mankind presents several well-defined problems, the study of which has occupied the minds of many scientific investigators in the fields of pathology, psychology and sociology.

The evil results of the use of excessive quantities of alcohol are so obvious and are so noticeably exhibited in all grades of social organization that it is a cause for wonder that in considering the alcohol question so much stress is laid upon the evil effects of excessive use and so comparatively little time devoted to the study of the effects of smaller or the so-called "moderate" amounts of alcohol. To be sure, the fundamental argument that whatever conditions alcohol induces when used in large amounts it must induce in lesser degree when used moderately has been emphasized, but it nevertheless remains a fact that a very large number of individuals use alcohol in moderate amount with no visible signs of deterioration or other untoward effect. Such individuals have long been considered as representing the value of the use, as distinguished from the misuse or abuse, of alcohol; for the enjoyment of the social glass, it has been said, cannot reasonably be considered as injurious to such users of alcohol, and is but a legitimate pleasure that should not be denied a large class of individuals for the sole reason that a certain class, larger to be sure, misuses alcohol.

We speak of moderate drinkers and those that use alcohol to excess; we speak of the use and misuse of alcohol, but is the line between these two degrees, moderation and excess, sharply defined in our minds? In the popular mind at least, a man is not said to drink to excess until he gives some signs of incipient intoxication; until the quantities consumed are sufficiently large to affect the speech or power of locomotion. The use of the visible signs of intoxication as an index of moderate or immoderate use is, however, fundamentally wrong. It is well known that healthy individuals vary widely in their tolerance to alcohol. While the old tippler can drink several ounces of raw whiskey and exhibit

no noticeable effects, the young man unaccustomed to its use may experience headache and dizziness with a single glass of wine.

We may say, in general, that long before intoxication is apparent the user has in nearly every case consumed more than is recognized by all authorities as the limit that is physiologically permissible.

As early as 1864 an English physician, Dr. Anstie, considered that one and one-half ounces of alcohol was the amount that could be taken per twenty-four hours without ill effect. Dr. Anstie's limit is to-day used as the dividing line between moderation and excess by many of the largest life insurance companies in the United States. We find such statements as these in the instructions to medical examiners:

"The daily use of any alcoholic beverage in excess of an amount representing one and one-half ounces of absolute alcohol (Anstie's limit) is not lightly regarded by the home office."

Another paragraph, copied from the medical examination blank of a large life insurance company, is especially interesting, as it endeavors to translate the term 'one and one-half ounces of absolute alcohol' into the equivalent quantities of the various common liquors:

"In reporting 'over-indulgence' in drink, draw the line — since there must be some fixed standard — at Anstie's limit of a daily allowance equivalent to one and one-half ounces of absolute alcohol. Such allowance will be represented, in the case of ardent spirits, by three ounces; of sherry or other strong wine by two wineglassfuls; of claret or champagne or other light wines by one 'pint' bottle; of strong ale or porter by three tumblerfuls; and of light ale or beer by four or five tumblerfuls."

Recently we have another standard established by Prof. J. J. Abel of the Johns Hopkins University.

"That there is a 'moderate' or average permissible quantity of alcohol I conclude from the experiments already cited; from the opinions of medical authorities in many fields; from the writings of economists, explorers and military authorities; and, lastly, from my own observations during a long residence in European countries; and this 'moderate' quantity I believe to be represented by one, or at most two, glasses of wine (10% alcohol) or one pint of beer, or their equivalents in terms of alcohol, in the twenty-four hours."

Abel's limit is, it is seen, about one-half that of Anstie.

Even the layman can see that these quantities are very much smaller than those ordinarily required to induce distinct intoxication. Furthermore with those accustomed to the use of alcohol the amount that can be ingested with no visible signs of intoxication is enormous. The following case is not believed to be uncommonly rare, remarkable as it may seem. I give the description as furnished me, prefacing with the statement that I have every reason to believe it correct, for subsequent correspondence has verified every detail.

"I have another acquaintance who is a real first-class 'lusher' and his 'case' I can report on with authority. About three years ago this latter case was boarding in the same house with me and nearly every night he and I played cards together, and it was his invariable habit to 'get outside' of an imperial quart of juice (whiskey) inside of three hours, from 9 p.m. to midnight, and oftentimes another pint on top of that. He never showed any signs of intoxication and was apparently perfectly O. K. in the morning, except his hand was of the 'early morning' variety. Through the day he also took numerous and sundry drinks of more than one variety of cocktails, etc., just how many I cannot say, as I was not with him. His daily quart he kept up from early June till into September, and later in the fall I saw him for several days, when he consumed the same amount. He was about thirty years of age, in apparent excellent health, never drunk to my knowledge, kept up his usual amount with great regularity; his drinking seemed to affect him not at all except shakiness in the morning. I have good reasons for believing he had been keeping this pace up for several years when I made his acquaintance and, so far as I know, still continues. He has, however, grown very stout and not disposed to take any exercise or make any exertion to get about."

Astonishing as these statements seem, it is nevertheless a fact that the large cities supply many such cases, and the use of intoxication, incipient or well-marked, as a measure of moderation or excess appears in the light of such a case distinctly absurd.

The tolerance of persons accustomed to the use of alcohol is no more remarkable than that exhibited by many persons in disease.

It is evident, therefore, that individuality and physical condition play a very important *role* in determining what is commonly meant by excess, and in a similar way it can be said that what applies to the state of intoxication likewise applies to the border line between moderation and excess. Moderation for one man may be decided excess for another. In taking into consideration either of the limits set by Anstie or Abel, therefore, we must remember that no general rule will apply in all cases, and one should hesitate very considerably before stating positively that either of the quantities designated by these authorities as "physiologically permissible" could be taken with impunity by all persons.

The first question that naturally arises in considering the effects of moderate drinking is "How does it affect the general health?" Obviously this question needs very careful study. One would naturally suppose that nothing would be easier than to determine this point by asking a large number of moderate drinkers if they noticed any special effect, beneficial or injurious, that they could reasonably attribute to their use of alcohol. A physician would place practically no value on such an investigation, for it is almost universally true that if a man likes alcohol he is

practically sure that, in small quantities at least it does him good.

Where, then, can we turn for impartial information on this most important point? A statistical study of the death-rate in large communities offers an excellent, though recognizably limited, field for study of this question. In hospitals, asylums and public institutions the opportunity is frequently had to secure data regarding the past and present habits of the individual with respect to the use of alcohol, and consequently furnishes the data for determining whether the death-rate is greater among total abstainers or drinkers. It is generally impossible to subdivide this latter class into moderate or immoderate drinkers, and the statistical evidence almost invariably found, *i. e.*, that the death-rate is noticeably lower among total abstainers, does not in reality prove anything except that those who drink to excess raised the death-rate of the class using alcohol.

Perhaps the most elaborate and careful study of the effect of the use of different amounts of alcohol on disease and the death-rate is that instituted by the Collective Investigation Committee of the British Medical Association and republished by the United States Brewers' Association in 1888. The method of investigation was, in brief, as follows:

As a result of a schedule sent to every member of the British Medical Association, 178 replies were received, reporting in all 4,234 deaths. These physicians were asked to copy from their death certificate book data regarding the patients, — occupation, social position, age at death and cause of death, and to indicate to which one of five classes the patient belonged. These classes were: (1) Total abstainers. (2) The habitually temperate, that is, men who drink small amounts and only with meals and rarely take spirits except for medicinal purposes. (3) The careless drinkers — men who without being intemperate or free-drinkers, yet do not confine themselves within a rigid rule; who do not demur to drinking spirits occasionally as a beverage; who may at times drink between meals or even to the extent of intoxication occasionally, but who do not make these practices a habit and, on the average, do not materially exceed what has been termed the "physiological amount" of one and one-half ounces of pure alcohol daily. (4) The free-drinkers — men who drink a fair amount or "take their wine freely," habitually exceeding the physiological amount to a material extent, but yet who cannot be called "drunkards" or considered to have forfeited a character for sobriety. (5) The decidedly intemperate, drinking men, hard drinkers and drunkards.

Though we may not agree with the nomenclature of these different classes, it is certainly obvious that considerable care was taken to segregate the users into fairly well-defined classes. It is very much to be regretted that the data regarding the first class are practically valueless, as it comprised less than 3% of the total number of cases. The conclusions that have

to do with the general question we are considering are:

"That habitual indulgence in alcoholic liquors beyond the most moderate amounts has a distinct tendency to shorten life, the average shortening being roughly proportional to the degree of indulgence.

"That total abstinence and habitual temperance augment considerably the chance of a death from old age or natural decay without special pathological lesion."

It is a digression that is, perhaps, warranted if reference is made to the present status of alcohol in medicine. In March, 1902, a meeting of the Suffolk District Medical Society was held in Boston, and a number of papers were read on the use of alcohol in therapeutics. In June, 1902, the annual meeting of the Massachusetts Medical Society was devoted to alcohol in therapeutics. The November (1902) number of the *Practitioner*, an English medical journal of high repute, is devoted to this question, and while there are arguments on both sides, the overwhelming opinion is that alcohol has been accorded a false position in therapeutics.

Alcohol is not going to be entirely discarded. It never will or never should go, as it is a therapeutic agent of great value in certain cases, but its rational use is to be very much more circumscribed than ever before. One very typical example of the change in opinion and custom is furnished by the records in the Massachusetts General Hospital in Boston, which used, in 1884, alcoholic beverages per patient per year to the amount of \$1.84, while in 1900 this amount had fallen to 29 cents per person per year.

The therapeutic action of alcohol is not primarily connected with the question we are discussing, — the moderate use of alcohol as a beverage, — but as many use alcohol on the pseudo-basis that it is "good for the health," it ought to be clearly stated that the most progressive medical men are changing their views radically regarding the use of alcohol as a tonic, aid to digestion, heart stimulant, etc. It has been a source of wonder to physicians that so few cases of alcoholic excess are attributable to the initial use of alcohol medicinally. This is undeniably true, but we Americans are notorious self-dosers, and it is certainly true that a large amount of alcohol has been taken, in a sense as a medicine, as an aid to digestion or as an appetizer. It is to be feared that the small percentage of alcoholics arising from alcohol prescribed by physicians would be many times multiplied from alcohol self-prescribed. Alcohol from the therapeutic standpoint of the best medical authorities is primarily a narcotic, and self-dosing with it cannot be countenanced by the medical profession.

We have seen the difficulties in ascertaining the effects of moderate drinking by the direct questioning of individuals, and we have seen that vital statistics in general are capable of a wide degree of interpretation, the chief element of error being the inability to distinguish satis-

factorily between the moderate and excessive users. If, however, instead of taking the vital statistics of a whole community, we take a class of selected lives in which, so far as possible, the excessive drinkers are eliminated and if, furthermore, we have means for distinguishing between the total abstainers and the moderate drinkers, data of much greater value for the question we are discussing may be accumulated. Almost ideal conditions for this differentiation obtain in the statistics of the great life insurance companies, for, as a recent writer in a medical journal strongly phrases it:

"Whatever difference of opinion there may be between the temperance fanatic and the tippler, the W. C. T. U. and Lincoln, as regards General Grant's special brand of fighting whiskey; the army canteen; drinking toasts in the White House; the traditional centenarian, whose chief diet is whiskey and tobacco; or the theory of alcohol as a food—I repeat, whatever opinions may exist on these and kindred topics, one thing is certain,—the financiers all over the world who have their money invested in life insurance companies all agree that drinkers belong in the class of hazardous risks."

In life insurance statistics we have the best separation of heavy drinkers from moderate drinkers that it is possible to make, as is shown by an examination of the conditions under which men are accepted as risks by life insurance companies. It has been said by medical men that a few companies will insure anything this side of the grave, but it is nevertheless a fact that the large number of the old line companies exercise every precaution to examine an applicant thoroughly and eliminate the hard drinkers.

The following questions are taken directly from the printed form of application for a policy in a large life insurance company, and are practically a copy of those used by all the large companies:

"Do you ever use or have you ever used wine, malt liquors or any alcoholic stimulant? If so, which, when and in what daily quantity? Have you ever used any of them to excess? Describe particularly your past habits in all these respects. Have you been or do you intend to be engaged in, or connected with, the manufacture or sale of intoxicating drinks or liquors? Have you been treated for alcohol or narcotic habit?"

The examining physician is also called upon to answer:

"Does applicant use beer, wine or other alcoholic stimulants daily and habitually? If not daily, how often? What is used and how much? What have the past habits been in this respect? Have any of them ever been used to excess? Are there evidences of impaired health or constitution from use of stimulants or narcotics? Has applicant taken treatment for alcohol or narcotic habit?"

In a special statement to medical examiners printed on the reverse of the policy we read: "The applicant's habits regarding the use of alcoholic stimulants . . . should be definitely ascertained, and in stating them in your report

avoid the use of such words as 'moderate,' 'occasional' and 'temperate.' Where their daily or frequent use is suspected, assure yourself that the stomach, liver, kidneys and nervous system are free from any evidence of injury."

If the number of questions is a fair index, much more importance is now laid on the applicant's relation to the use of alcoholic liquors than twenty years ago.

In spite of every precaution, a number of heavy drinkers are able to get insurance, and a large number of the lawsuits over insurance matters are on the ground of the excessive use of liquors and therefore a violation of the part of the contract covering the applicant's answers, for those answers are now made a definite part of the insurance contract, and hence greater care must be exercised on the part of the applicant to avoid any chance for suspected fraud.

It is the custom of many of the large life insurance companies to keep an eye on the physical condition of their risks. This shows that there is at least an effort made to keep out the hazardous lives, for in such cases the companies lose no opportunity to drop the risk and refuse to reinstate him after an overdue premium.

Consequently it seems a fair statement that those carrying life insurance are selected lives; the proportion of heavy drinkers is kept at a minimum; and that no statistics as yet available separate in any better way the moderate from excessive drinkers in a community.

The further segregation of risks into the two classes, abstainers and non-abstainers, has not been common, at least in this country, though there are several societies in England that have done this for a number of years. Obviously, a study of the death-rate of total abstainers and the moderate drinkers would give the best comparisons of the effect of the moderate drinking of alcohol upon health.

The office having the largest experience in abstainers' lives is the United Kingdom Temperance and General Provident Institution, which was established mainly by Friends in 1840, and has accumulated funds amounting to about \$30,000,000. It is one of the largest English mutual companies. For a number of years after its establishment, only abstainers were admitted. Later on the lives of carefully selected moderate drinkers were accepted, but the two classes were kept separate and distinct, and the bonus or profits awarded each five years to the members of the two classes. During the past thirty-five years (1866-1901), the general average ratio of actual to expected deaths in the total abstinence section has been 24.7% less than that in the general section. The bonus was correspondingly greater in the temperance section. Similar results are reported from all the other companies making this distinction between total abstainers and moderate drinkers.

In the American companies very little data are at hand. The most elaborate investigation was carried out under the direction of Dr. Emory McClintock, actuary of the Mutual Life Insur-

ance Company of New York in 1895. In his report on the results of his investigation, Dr. McClintock says: "The abstainers show, therefore, a death loss of 78% of the maximum and the non-abstainers 96%." This difference in favor of the abstainer is slightly lower than that of the English companies. While undoubtedly there may be a valid question raised as to what proportion of this favorable death-rate is due to general good habits irrespective of the use of alcohol, the difference of nearly 25% in the English companies and of 18% in the investigation of Dr. McClintock is obviously altogether too large to attribute wholly to habits other than that relating to the use of alcohol.

Just what is scientific and what is not is sometimes difficult to state, and although personal opinions founded on impressions can hardly be considered as scientific, in accumulating the material for this paper I have had considerable correspondence with a number of insurance authorities, all high officials in the large old line companies, whose opinions surely are worthy of consideration.

A physician, president of the medical board, writes: "We have on several occasions endeavored to utilize the statistics in our possession, but have found it difficult to arrive at any satisfactory conclusion, save the general one that anything but the very moderate and occasional use of liquors is prejudicial." (Oct. 28, 1902.)

The president of another writes: "As between the two classes (total abstainers and non-abstainers) we know there is no question that the total abstainers are the better risks." (Jan. 26, 1903.)

From the actuary of another we have much the same: "Personally I am convinced that the mortality among total abstainers always has been and always will be less than among moderate drinkers of alcoholic beverages." (Oct. 15, 1902.)

A recent writer in the *Spectator* the recognized organ of the life insurance business says: "It is now becoming generally recognized that the alcohol habit is one of the main factors in determining the length of life. No life office will knowingly accept the proposal of any one known as a hard drinker. Evidence of a very striking kind is rapidly accumulating which shows that even the moderate use of alcohol is prejudicial to health and longevity. In England about a dozen life offices recognize this fact in one of two ways: (1) By giving a reduction of premium to abstainers, or (2) awarding them a larger share in the profits. Last year the Sun, one of the oldest life offices, established in 1810, opened a special section for abstainers, giving them a reduction of 5% in their premiums. When the Sun life office announced a reduction in premiums for abstainers, *The Financial Times*, commenting on the fact, said: 'A battle has long ranged round the figures of those offices which keep their men in separate sections and always show a higher bonus to the longer-lived abstinent. Strenuous efforts have been made to minimize these important statistics, and it is quite likely

that they do not mean all that has been claimed for them, but when we see a first-rate company like the Sun offering a direct and immediate cash bonus to abstainers, it looks very much as if the case had been proved.'" (Aug. 22, 1901.)

Among the multitudinous effects of alcohol on the human organism, none is so characteristic and invariable as that upon the higher senses. Professor Abel says:

"The best bred man indulging in wine with permissible moderation no more escapes the minor psychical changes induced by it than does its meaner slave fail of its sense-destroying power when he drinks 'till he remembers his misery no more.' In the case of the former the mental changes induced will never attain the degree when self-respect and social conduct are outraged and they will pass unnoticed by all except those who are keen observers of their own mental states."

The effects of the smaller or moderate doses on mental activity are generally no more apparent to the ordinary observer than are the effects of similar quantities on health or length of life. To the trained observer in the psychological laboratory, however, small quantities of alcohol produce certain well-marked and characteristic phenomena in the brain action that should be very carefully and clearly stated to the general public, for they play a very important rôle in determining a man's efficiency in the struggle for existence. The lesser psychical effects of alcohol were not clearly defined until the experimental psychologist elaborated his methods for studying the mental state of man. By means of certain forms of apparatus and tests to be found in every psychological laboratory, it is not difficult to determine with reasonable accuracy the mental activity of an individual. Any variation from the normal is easily detected, and consequently the work of experimental psychologists, especially Kraepelin and his school, furnishes reliable data for a consideration of the effect of alcohol on these higher mental processes. The initial apparent mental stimulation immediately following the ingestion of small quantities of alcohol observed in some of the simpler tests was generally followed by a retardation period which resulted in a sum total of depression, and with the types of mental activity involving constructive operations, the time required for the completion of the mental process was lengthened from the first.

These results on small quantities of alcohol taken in a single dose are, however, not of as much importance or have not the significance of those experiments in which the alcohol was administered in small quantities for a considerable period of time. In the experiments of August Smith, the amount of alcohol used was about two and one-half ounces per twenty-four hours, and his data admit of no other possible deduction than a noticeably inferior mental activity, which, indeed, was apparent after eight days of abstinence.

In general, we may say that alcohol diminishes

all forms of mental activity. The different phases of this process are very complex, but the accepted explanation of to-day is that alcohol paralyzes the inhibitory functions, and the reserve naturally acquired with age is cast off; a spirit of recklessness and of disregard of consequences is developed. If larger amounts of alcohol are taken, the speech becomes freer, a feeling of egotism is paramount and doubtless more than one brilliant speech has been *delivered* under this apparent stimulus, though in its *preparation* the effect of alcohol could have been but deleterious. As the quantity of alcohol ingested becomes larger, the subject becomes loquacious, boisterous, careless of speech, a coarseness and vulgarity enters into his remarks and finally the speech becomes thick and unintelligible, locomotion becomes impossible and a deep coma is induced. The last acquisitions of mature man are the first to be affected, the first movements of the child the last to give way to the action of alcohol. All these effects, from the retardation of mental processes by small quantities to complete intoxication by larger amounts, form a perfectly connected series of phenomena of alcoholic narcotization.

The consideration of the paralyzing action of alcohol on mental processes brings us face to face with one of the most important phases of the struggle for human existence. By just so much as alcohol in large or small quantities diminishes mental activity, by just so much does it handicap the man whose keenness of perception and manipulative skill are absolutely essential to him in this day of the sharpest competition known in the history of the world. The brain incipiently narcotized is not a normal organ; a man is not that complete master of himself that he must be to succeed, with that most intricate organism, the brain, imperfectly functioning. Smith tells us that quantities of alcohol of about two and one-half ounces retarded brain action even after a week of abstinence. Other observers have noticed this last-mentioned effect, and Professor Cushny points out that if this is true many habitual drinkers, even if using moderate amounts, are persistently narcotized and never their real selves.

One of Kraepelin's pupils, Aschaffenburg, contributed greatly to our knowledge of the influence of alcohol on practical work involving mental processes by his experiment on the effect of one and one-quarter ounces of alcohol on four typesetters. This form of work is peculiarly adapted to the study of questions of this nature. The subjects were all accustomed to the use of beer, but abstained for the experimental period. Every detail was so perfected that the test was scientifically accurate and simultaneously adapted to the practical every-day life of the men, with the single exception of enforced abstinence. On the second and fourth days, each man was given one and one-quarter ounces of alcohol in the form of a Greek wine fifteen minutes before the regular working test began. Although there were no more errors than usual, the amount of

work done with alcohol was 15% less than that done without it. Here we have a complete scientific demonstration of the effect of a so-called moderate amount of alcohol (Anstie's limit) on the efficiency of labor.

This brings us to the very important question of the relation of the efficiency of labor to the success of employer and employee alike. America, by reason of her progressiveness and ingenuity, occupies a prominent position in the manufacturing industry of the world and consequently the deleterious action of even small amounts of alcohol on mental activity and efficiency must be carefully guarded against in order to avoid the handicap the English workman has by reason of his custom of drinking alcoholic liquors during working hours. We are told that the recently returned Mosely commission has emphasized this point in comparing American and English workmen. That our manufacturers have been alive to this question is evident from the report of Commissioner of Labor Carroll D. Wright on "Economic Aspects of the Liquor Problem." Of the 7,000 establishments examined, over 75% in employing new men were accustomed to give consideration to the habits as to the use of intoxicating liquors, and more than half made some requirement that all employees or employees in certain occupations shall not use intoxicating liquors.

In response to a letter asking for the rules of the New York, New Haven & Hartford Railroad regarding the use of alcoholic liquors by employees, the following was received from the office of the first vice-president:

"In our book of rules for the government of the operating department we have a rule reading as follows: 'The use of intoxicants by employees while on duty is prohibited. Their habitual use or the frequenting of places where they are sold is sufficient cause for dismissal.'" The writer adds: "This, I believe, is the almost universal practice on railroads in the United States." (Dec. 24, 1902.)

Applicants for employment on the Boston Elevated Road are required to take oath that they do not use intoxicating liquors, if such is the case. Those not taking this oath are not considered. The rules of the company concerning the use of liquor are as follows: "If a car service man is known to enter a saloon in uniform, he is suspended from work for seven days. If he enters a saloon in uniform a second time he is discharged. If he is known to be intoxicated, whether on duty or not, he is discharged."

It is clear that at least in certain employments strict measures are adopted to insure the highest efficiency by practically prohibiting the use of alcohol, for that is what it really amounts to in a large number of cases. A man cannot use alcohol and retain his position. I believe that this action on the part of employers of labor will become more and more universal, for a problem involving so great social and economic interests as the effect of the moderate use of alcohol on the efficiency of labor is sure to attract increas-

ing attention. All employers cannot do as Mr. Carnegie is reported as doing, that is, give each employee a check amounting to 10% of his yearly wages if he can truthfully say that he did not touch intoxicating liquors during the past year, but certainly the increased efficiency and the reliability that is exhibited in a marked degree by the abstainer is sure to tell in the amount, if not the quality, of his production, and ultimately this fact will have to be recognized by all the employers.

Two years ago I heard a young clerk remark that in Boston it was considered decidedly unwise for a bank clerk to use beer or wine at his noon lunch. The following letter from one of the best-known banking men in Boston is self-explanatory: "I know one bank teller who lost his place because the directors knew that he frequented an ale and beer counter for his lunch and took those drinks with the food.

"I know a bank bookkeeper who had been marked for the cashiership of another bank, but the president of the latter, going to New York on the same boat, saw him using similar drinks and concluded that he would better not take the risk. The president afterwards stated this in my hearing. Of course individual opinions differ in that matter as in all others, but the practice is not looked upon with favor by bank managers, at least in Boston." (Oct. 29, 1902.)

A personal letter from a railroad president, probably one of the finest examples of a man living the strenuous life, throws an interesting light on the moderate use of alcohol and the relation between employer and employee:

"I more and more hear it said by business men that the business man of the future must be a total abstainer. It is very generally the practice now, I think, for men who take wine at dinner not to take anything at luncheon or during business hours. This would seem to indicate that the use of alcoholic liquors is considered on the whole injurious. It is well known, also, that so far as employees are concerned, all large employers establish rules which make it practically impossible for an employee who uses liquor to remain in the service." (Dec. 30, 1902.)

The president of a large life insurance company writes in a personal letter, the phraseology of which is so telling that I give it in detail: "More and more does the man who works with either his head or his hands need for the efficiency which is absolutely demanded of him that clearness and steadiness which is possible only to a high degree of temperance; and the man who impairs his efficiency and loses time through indulgence is walking toward the door that will shut him out from promotion and even employment. Men, whatever their position or range of their capacity, cannot in these days afford to be at less than their best." (Jan. 26, 1903.) Such statements as these have a force and significance that must demand attention. The experience of the large employer of labor verifies in the smallest detail the deductions of the psychological laboratory — that the mod-

erate use of alcohol diminishes a man's efficiency.

The fact that a large number of individuals become so addicted to the use of alcohol that it requires all the skill of the medical profession, accompanied by every known psychological aid, to combat the self-destroying appetite, demands a careful consideration of the danger of acquiring the alcohol habit as a result of its "moderate" use. Just what the alcohol appetite is has been the subject of much discussion in medical, sociological and psychological journals. That it is hereditary is in opposition to Weissman's theory, and probably we must admit that a craving for alcoholic liquors is not directly transmitted from parent to child. That the resistance of the individual to the narcotic effects of alcohol is lowered by the alcoholic progenitors seems to be much more likely to be the case. The idea that a craving is transmitted has, as Partridge points out, unquestionably done an incalculable amount of harm by relieving the individual of a sense of moral responsibility. "The belief that a habit is incurable does more than anything else to compel its continuance." The theory that the moderate use of alcohol can transmit a craving for alcohol would hardly seem plausible; but that the resistance to the strong impulse to use alcohol after acquaintance with it may be weaker in the progeny of moderate drinkers is in no sense an unreasonable assumption, though lacking in absolute proof.

That the use of moderate quantities of alcohol has a strong tendency to lead to its excessive use is a matter of common observation. To what extent this acquisition of the alcohol appetite prevails is very difficult to estimate, for unless a man drinks to intoxication we have no means of knowing the quantity used. The only statistical data at hand are those by Neison, quoted in Sieveking's "Medical Adviser in Life Assurance." There it is estimated that there is one drunkard for every 74 of the male population, and a footnote by Sieveking adds, "We fear that more recent investigations show even a larger proportion." In the investigation of the British Medical Association previously referred to, we have, of the 4,234 cases, all over the age of twenty-five years, 30% decidedly intemperate and 15%, or one in six, very hard drinkers.

If these proportions are generally true, the danger of the habit-forming tendency of alcohol is indeed a real one. Furthermore, as we have seen, long before the drunkard stage has been reached, the individual has passed the most liberal estimate as to what is moderation, and is drinking to excess. Consequently we may *very conservatively* estimate that one in 50 of our male population uses liquor to excess and has a well-defined, though not necessarily absolutely, uncontrollable appetite for alcohol. A physician with a large practice, an instructor of twenty-five years' standing in one of our largest medical schools, in answer to a request for his opinion on the habit-forming tendency of alcohol says: "In my experience the habit-forming tendency

has been so apparent in every single individual that I do not think it can be for an instant questioned. I have seen so many times the teaspoonful of whiskey or the half glass of beer or the little glass of wine taken at a regular time so looked forward to and so many times gradually increased, and I have had to interdict the use of it, that I cannot feel this is a thing which can be questioned for a moment, that any amount of drinking, no matter how small, invariably tends to form a habit which inevitably tends to increase." (Oct. 22, 1902.)

The medical director of a large life insurance company writes: "The great trouble (with occasional drinking) is that a young man may get into the habit of taking some form of alcohol every day, and in this I include beer and ale, and as he grows older he may feel the necessity for a larger amount, and before he realizes it he has become an habitual drinker." (Oct. 20, 1902.)

Certainly it is not unreasonable to conclude from this evidence that there is a real danger from the habit-forming tendency of alcohol --- a danger that we should not overlook in any consideration of the use of alcohol.

We can now more intelligently consider the conditions existing in actual life and determine in how far the moderate use of alcohol is compatible with scientific deductions. Obviously, we must very decidedly alter our views regarding what is moderation and what is excess. Certainly Abel's limit of one pint of beer per day is not too conservative. Indeed, the facts here collated would lead to the emphatic discountenancing of the *habitual* use of alcohol in any amounts. We may say with entire reason that many of our best citizens, men the products of whose brains have furthered our commerce and industries, literature, science and religion, have used liquors in moderation and perhaps habitually all their lives and yet are apparently not injured by them. But such men are, in fact, but a very small proportion of our male population, and we must consider the effect of moderate drinking not only on a select class of men, whose very success in life has shown their superior ability to exercise judgment and restrain upon their impulses and practices, but we have to consider its effects on the average man.

Dr. J. S. Billings has, at the instance of the Committee of Fifty, prepared a statement of the result of a series of questions submitted to 900 men of the type designated above as "selected." They were the typical brain workers of the United States. Accompanying the schedule returned with the answers, a number of individuals added paragraphs expressing their personal opinion. The same differences of opinion invariably found in an investigation of this nature are here present, though the general opinion is to the effect that the use of alcoholic drinks as a stimulus to mental effort gives bad results, although they may be agreeable as restoratives in fatigue.

Thus these data indicate that even to the select

class of men the moderate use of alcohol is, on the average, of doubtful benefit, and we see here nothing to alter our view that the *habitual* use of small amounts of alcohol cannot be considered innocuous even to the select class of men. As regards the *occasional* use we may say that those men over forty, whose self-restraint is such as to insure that "self-respect and social conduct" are never outraged, who use *occasionally* the glass of wine with the last meal of the day and after the important work of the day has been done, are the individuals whose use of alcohol is least incompatible with the teachings of science.

With the average man, and especially with the young man, the case is very different. The average man, with perhaps a family or relatives dependent on him, should not jeopardize his chances for success by the use of alcohol. The diminution in mental and muscular power invariably accompanying the use of even small amounts of alcohol is a potent factor in determining his efficiency, chance for promotion and appreciation by his employers. Clearness of thought, quickness of perception, keenness of sight, deftness of touch, skill and accuracy in manipulation are valuable assets of the successful man, and each and all of these factors are so immediately affected by the use of alcohol as to practically interdict its use with men whose ambition leads them to hope for and strive for the best in life.

Statistics show that the drink habit is formed most frequently between the ages of fifteen and twenty-five, and it is with the young man that special pains should be taken to show clearly that any use of alcohol, even though it be occasional, must be regarded as contrary to scientific teachings. While alcohol in small amounts does not produce any demonstrable changes in the tissues, it certainly does retard the physical and mental growth of youth, for the growing organism is especially susceptible to the injurious effects of alcohol. The habit-forming tendency of alcohol is, as has been stated before, a factor in the moderate use of alcohol that it is absolutely necessary to take into consideration. No man need fear an inherited craving until he first tastes alcohol. As Partridge says, it is inconceivable that a person can crave a thing that is outside of his experience. Because the father was a heavy drinker it is, however, absolutely necessary for the son to abstain wholly would he avoid the great danger of forming a habit.

In general, while the impulses are uncontrolled by that reserve acquired with age, the danger of forming the habit must always be recognized, and by acquiring the alcohol habit I do not necessarily mean to the degree that the user becomes a miserable sot, but the feeling of the need of any amount of alcohol regularly --- a feeling that can be considered in no other way than an injurious habit, sure to be followed by a train of physical and mental misfortunes that distinctly incapacitates the sufferer for the normal life of man.