In the course of our studies we observed a recurrence, or second infection, in two patients. The one had as his first infection a member of Group IV, and the other a member of Group II. In their second attack both suffered from infections belonging to Group I. The one was exposed to an infection with a Group I organism, because on two occasions of several days' duration he had occupied a bed adjacent to a patient suffering from an infection belonging to Group I. As to a similar exposure of the other, we are not certain, though he was in the same ward with patients infected with the other groups of pneumococci. Both recovered from both attacks.

SUMMARY

The foregoing report shows that the incidence of the various groups of pneumococci occurs in a similar ratio to that in the pneumonias elsewhere. The mortality is fairly comparable. When blood cultures are taken, those yielding positive results are more serious, though one would probably obtain many more positive cultures if they were taken daily. It would seem that most of the instances of meningitis are due to organisms of Group I. When numerous cultures are taken from several sources in the patient, these cultures invariably belong to a single group.

A UNIFORM AND GENERALLY APPLICABLE SYSTEM FOR REPORTING SURGICAL END-RESULTS

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The foundation of future progress in surgery must consist largely of a comprehensive understanding of the successes and failures of the past. In view of the fact that several million operations have been performed in this country alone during recent years, we should now have abundant data about the end-results of operations frequently performed. The lack of available end-result data in many important fields of surgery is little short of amazing.

A few years ago, the medical director of one of the life insurance companies undertook to determine the insurability of persons recovering from the commoner types of surgical kidneys. Out of 100 surgeons consulted, only eight were able to furnish data of any value on the subject, and the medical director was obliged to conclude that very few surgeons could make a definite statement, based on their own work, concerning the ultimate effect of their kidney operations on the comfort and duration of life of their patients.

At the lowest estimate, between 20,000 and 30,000 operations for exophthalmic goiter have been performed in this country during the past ten years. Yet, except for some fragmentary data on the subject of the operative mortality and general trend of the end-results obtained in several clinics in which special skill has been developed in handling these cases, the surgical profession itself is in almost complete ignorance as to the actual results obtained through this large number of operations for exophthalmic goiter. During the same period, there have been several hundred thousand operations on the gallbladder and ducts; yet up to June, 1917, surgeons have had no

really definite data to show the frequency of recurrences after these operations. No one knows the relative proportion of recurrences following cholecystostomy and cholecystectomy, and today the whole question of cholecystostomy versus cholecystectomy is debatable because the data to settle the question have not been collected. As a matter of fact, much of the literature of the past few years has been based on only the most meager and indefinite data. A similar lack of adequate end-result knowledge might be cited in many other fields of surgery.

Several reasons have been assigned for this lack of knowledge, such as the difficulty of keeping track of patients and the time and labor required to ascertain and record the results. My own end-result studies, carried on through a period of ten years, have convinced me that the chief reason for our present-day lack of end-result knowledge is that surgeons have not as yet devised a uniform and satisfactory system of reporting the data they have collected. Surgical literature is full of communications dealing in a general way with the subject of end-results, in which it is evident that authors possess considerable data which they despair of presenting in other than the most general terms.

Some time ago, I found that I had several thousand histories with end-result records extending over fairly adequate periods of time. But whereas these records had been collected with, let us say, one unit of energy on my part, when I came to study any one group of cases, it took several units of time and energy to put the data into form suitable for study and comparison. In some groups, it was quite impossible to classify the results according to the usual standards. Also I found that no two surgeons adopted the same standards in reporting their cases, so that it was impossible to compare small groups from different sources or to combine them into larger series, of greater statistical value.

As a rule, surgeons have attempted to state their end-results in terms such as "cured," "improved," "unimproved" or "dead." The trouble with this system is that in practice it is often quite impossible to assign a given case under any one head. As a typical example of the difficulties encountered, I will cite the following gallbladder case:

A man, aged 45, had typical gallstone attacks for twenty-five years. A cholecystostomy was performed, Nov. 10, 1908. The ducts were free; 1,675 stones were removed from the gallbladder. Seven years after this operation, the patient told me that he had never had a symptom of his old trouble, and felt ten years younger than he did before the operation. Seven years and five months after the operation, however, he again developed gallstone colics accompanied by jaundice which increased in frequency and severity until, eight years and four months after the first operation, he was again operated on and a large stone removed from the common duct.

It is obvious that this case does not fit under the heading "cured" or, for that matter, in any other group. It is also obvious that the only way to state the end-results of the first operation in this case is to use some statistical method which will give the first operation credit for a cure extending over seven years and five months, after which there was no further benefit from this operation. Thus far, this patient's history has been traced eight years and five months, during 88 per cent. of which time he was cured by the original cholecystostomy.

Similar difficulties occur with greater or less frequency in practically all fields of surgery. In cases of exophthalmic goiter it is practically impossible to state the end-results following operations in the terms usually employed by surgeons reporting end-results. Gallbladder and kidney cases are little, if any, better, and gynecologic cases present similar difficulties. When we seek the reason for the difficulties encountered in trying to state end-results in such simple terms as "cured" and "improved," it is evident that these terms are descriptive of the relative postoperative health at a given period of time only, whereas to give a true description of the postoperative health of the patient, extending over a period of months or years, the element of time must be included in the description. It is as illogical to attempt to measure the postoperative life in terms that ignore the time factor as it would be to attempt to measure a plot of ground in terms of one dimension.

All the major difficulties of presenting the end-results disappear if we tabulate the results in terms

hundred cases may be detailed on a page or two of a medical journal. To summarize an entire series of cases, it is only necessary to add the figures and strike the averages, and the results show at a glance the mean postoperative prognosis for the disease in question in the hands of the surgeon making the report.

The wealth of information conveyed by data summarized by this method is often surprising. For instance, a glance at the "years operated" column in the accompanying table reveals the fact that the surgeon reporting these cases did a number of cholecystostomies for noncalculous cholecystitis, but that this operation has not been popular with him in recent years. It also shows that lately he has been doing cholecystectomy in similar cases.

In conclusion, I wish to emphasize the fact that the plan for recording end-results as described in the foregoing is almost universally applicable to the summarizing of surgical end-results. If it were generally adopted by surgeons in reporting their results, then data from diverse sources would become available for

END-RESULTS FOLLOWING GALLBLADDER OPERATIONS

Diagnosis	Operation	Operations	Years Operated	Average Years Operated	Years Traced	Average Years Traced	Cured		Improved		Unimproved		Deaths	
							Years	Per Cent.	Years	Per Cent.	Years	Per Cent.	Years	Per Cent.
Gallstones.....	Cholecystostomy	42	190 1/12	4 6/12	121 1/12	2 9/12	87 3/12	72	23 3/12	19	7 4/12	6	3 4/12	3
Gallstones.....	Cholecystectomy	28	87 7/12	3	64 1/12	2 4/12	46 9/12	73	10 9/12	17	1 10/12	3	4 9/12	7
Cholecystitis....	Cholecystostomy	13	88 2/12	6 9/12	51	3 11/12	9 10/12	19	21 2/12	41	20	40	0	0
Cholecystitis....	Cholecystectomy	14	20 11/12	1 6/12	16 8/12	1 2/12	10 3/12	62	3 5/12	20	3	18	0	0
Common duct.....		3	5 3/12	1 8/12	5 1/12	1 8/12	1	..		..		..	4 1/12	...
Totals.....		100	392	3 11/12	257 11/12	2 7/12	58 6/12	60	58 6/12	22.6	32 2/12	12.4	12 2/12	5

of the periods of time for which the patients' histories have been traced after the operation, together with their state of health for the time periods. By this method, the "cured" column becomes "years cured," and the term "years" is added to the other divisions. It is also of advantage to add the headings "years operated" and "years traced," as illustrated in the accompanying table, which shows the results of tabulating 100 gallbladder cases by this method.

A statistical correction should be made for the cases in which the patients die immediately after operation. As their histories are traced up to the time of death, it would be obviously unfair to give them full time in the "years dead" column. The factor for correction here is the proportion of the total postoperative time for which surgeons have been able to trace their patients. On the assumption that they have been traced 80 per cent. of the total postoperative time, a patient dying at operation five years before is given 80 per cent. of this time, or four years, in the "years dead" column.

The advantages of this system of recording end-results are quite obvious. No matter how complicated the postoperative history, it may be readily subdivided and classified into the appropriate periods. It is not necessary for the surgeon to trace each case to the time of reporting his results. If he has lost track of his patients soon after operation, this fact is clearly shown by his figures, and the value of the data may be judged accordingly. Long series of cases may be reported individually, by the use of only a line to a case, so that the postoperative histories of several

the compilation of long series of cases and for the numerous comparative studies which are necessary if we are to determine the real factors making for success or failure in our work.

Illuminating Company Building.

Production of Vegetable Oils.—The war has made the production of all sorts of fats and oils highly important. Consul Charles L. Hoover at Sao Paulo, Brazil, in *Commerce Reports*, November 21, reports on the development of the vegetable oil industry in his district. Although a great deal of cotton has been raised in the state, until recently no cottonseed oil was produced, all of it used being imported from the United States. The manufacture of the oil has now begun, however, and several factories are in operation, oil of the highest quality being produced. Whereas in 1913 over 2 million pounds of oil was imported, in 1917 only two small shipments were brought in and the exports considerably exceeded the imports. Castor oil is another oil that is now being produced in that state. The castor bean grows wild and has been regarded as something of a pest, as it is hard to eradicate. Modern machinery is being bought in the United States for producing the oil in larger quantities. Linseed oil has heretofore been imported almost exclusively from England and Argentina. Preparations are now being made to produce this oil from the flaxseed, which is being extensively grown. Peanuts are also now being given attention as a source of oil. Several varieties of nuts found in the district are available for their oil. Among these are the cashew nut, the ucuba, which is said to be 60 per cent. vegetable tallow, and the babasu, which also contains 60 per cent. of oil. The babasu nut, it is said, will burn for half an hour if a match is touched to it. Its kernel is like copra, and it is excellent for soap making.