cates, and nouns from the verbs. From their *desinences* he reconstructed stems and roots, like his predecessors, and with the aid of these, finally, the flow and rhythm, as it were, of a meaningless language. The next step was to find a corresponding grammatical lilt in other tongues, regardless of their nearness or remoteness to the Tuscan habitat. After diligent searching—since phenomena of this order are not very well indexed yet—Martha found the required grammatical analogies in the Ugro-Finnic tongues, a racial group which is now best represented in Europe by the Magyar or Hungarian dialects, and of course by Finnish. Since Martha is by no means the first scholar to read these languages, the reader would be hasty to infer that any Finn or Hungarian can understand the transcription of an Etruscan text at sight. The case is more like putting a contemporary Greek at reading one of the Cypriote inscriptions in the Metropolitan Museum, or a modern Arab at reading Himyaritic epitaphs. Martha's method has endured one severe test, however. His rendering of the Agram text discloses a manual of navigation in its mysterious leftward-running lines. Victor Bérard recently traced the incorporation of Phœnician sailing directions and navigators' logs in the Homeric Odyssey. The Agram *liber linteus* is a lost waif of the Etruscan admiralty publications, if one may employ this modern term.

Martha's translations of the epitaph literature carry us a little nearer, perhaps, to the soul of Etruria. "Tute was Larth, and now Tute is wretched." Here we have thesepulchral change of name. "He was a strong man, an accomplished man. Eight times he wore the bordered robe." The obituary notices of the future will doubtless celebrate the non-recall of American magistrates with similar unction. "But now he is nothing."

Ludwig Steub, a Bavarian alpinist, discovered the Etruscan derivations of innumerable Alpine place names, years ago. They lent support to his theory that the conquerors of northern and central Italy entered the peninsula through the Tyrolean passes. With Martha, we can now almost follow the Ugro-Finnic migration westward from the Ural Mountains to its tricuspid forking into Finland, Italy and Hungary. Here philology deserts us. But the archeological evidence continues to favor our recognition of another eastward push of the same race, which bore fruit in its settlement of southwestern Japan.

A Decadent Sense

TO THE fundamental principle of modern biology that any organ which is decreasingly used tends to degenerate and become rudimentary, is ascribed the modern decadence of the sense of smell in man, a subject discussed by H. Ahlenstiel in a late number of *Umschau*.

The business of life is no longer directed or determined by olfactory stimulation, as was frequently, if not always, the case in a more primitive era. "Nature

herself values this sense so lightly that she allows such a general and insignificant malady as the 'cold in the head' to cripple it for longer or shorter periods. Man to-day is a creature of eye and ear. The olfactory sense is decadent.

"The modern man has in a very brief time lost the perception of many odors of which his ancestors were sensible. For example, the physicians of the middle ages could still recognize diseases by their odors, and according to Humboldt the Peruvian Indians could track game by the scent as well as hunting dogs. And to understand such curious phrases as 'In the odor of sanctity,' and 'To be in bad odor in the community,' we must conceive that formerly certain odors were perceptible in such instances."

Besides this *quantitative* loss Ahlenstiel finds there is a far more important *qualitative* loss, one evidence of which is inability to analyze the component elements of mixed odors, a defect comparable to that of an eye without a lens, in which case sensations of color and brightness are received, but clear outlines of objects are not perceived. Such an eye is manifestly imperfect, and so is such a nose, compared to that of the dog, with its power to analyze a mixture of odors and select and follow any given one as we can a definite optical stimulus.

A third evidence that the olfactory organ is degenerating consists in the speediness with which it becomes fatigued. Thus people quickly cease to be conscious of the perfume on their clothing and workmen in sewers soon become oblivious of the evil atmosphere about them.

"The sense of smell has nothing more to say to us; and since it would be purposeless and unbiologic for an empty sensation, incapable of yielding us data for vital conclusions, to make demands on the powers of attention, after a short time the door of the nose is closed to the stimulus which assails it; while the dog, on the other hand, is capable of tracking game by the faintest scent for hours without tiring, since his olfactory organ is intrusted with the vital function of detecting food supplies."

Smell is important to us now only in connection with the appetite, and in this case it is commonly confused with *taste*. But taste is really capable only of distinguishing the sensations of sweet, sour, bitter, and salty. All other flavors are really *smelt*, though with the difference that the stimuli do not come in the normal way, through the external nasal orifices, but from the vapors of the food rising through the oral passages in the rear of the nose.

The most interesting part of Ahlenstiel's article, however, deals with the singular power—often noted in history and literature—of olfactory stimuli to awaken vivid memories of past scenes and events. He explains this as follows: "When an odor which we have smelled

for a time in a more or less important period of our lives—for example, the reek of the dunghoops during a stay in the country or the smell of the tarred boats in the harbor on a vacation trip—comes to us a long time after in a different place with the same intensity, we are at first conscious only of a familiar odor. But then nature begins to feel that a sensation which at one time played a not insignificant part in our lives can not be ignored, . . . and she opens before us all the doors of the past and presents a host of memories, questioning whether any among them is significant.

"This leads us to the query whether olfactory stimuli can be purposely assembled and grouped to awaken similar sensations by art, just as is done with optical stimuli in painting and the plastic arts, and with acoustic stimuli in music. In some measure this is actually practised and constitutes the art of perfumery. This is held somewhat in contempt through its one-sided development. Only the so-called fragrant substances are represented. That there are among these a series of delicate and delightful odors cannot be denied—nor can reproach be offered to the discreet use of a refined perfume. But the fact is overlooked that these 'fragrant substances' constitute only a small part of the odor-bearing products—even of those of agreeable odor.

"And there are not wanting signs that before long a much higher valuation will be set upon odors, and it looks as if people were beginning to prize the sensations proffered by various odoriferous substances besides the so-called 'fragrant' ones. To our grandparents the reek from automobiles, the smoke of locomotives, the iodoform aroma of the hospital, are still disagreeable, still banned by the taste of the last century—we, their descendants, no longer fear to love life itself as it is.

"It seems questionable, however, whether we are as yet far enough advanced to make use of the above mentioned relation between odors and memory, and by corresponding combinations—naturally modified individually—to evoke memories and moods from the Sea of the Past, and thus create, as it were, a sort of symphony of odors.

"But such a thing is by no means impossible; and if there are serious obstacles to it under normal conditions, on the other hand there is a condition—that of sleep—in which many of these vanish, and in which this experiment has been successfully tried. Thus Verworn tells us in his "Mechanism of the Psychical Life" (*Mechanik des Geisteslebens*) of an experiment—instituted, to be sure, to other ends—in which a perfume which he had brought from Egypt was held to the nose of a sleeper, whereupon he dreamed he was entering the booth in the Bazaar of Cairo, in which he had brought the perfume, etc. We have here, therefore, succeeded, though under abnormal conditions, in vividly reviving latent memories by stimulating the sense of smell."

Electricity as a Factor in Civilization*

Its Influence in Industry, Commerce, and in the Home

By Dr. J. Siegel

PHENOMENA that strike us as new and novel, things we meet for the first time, are apt to produce in us a certain feeling of awe, curiosity and surprise, at the same time of gratification. They first enter our existence as merely personal experience, manifesting themselves as sensations. Not until these feelings have died away is reflection added—that intellectual faculty by which we appreciate the value, or otherwise, of the new phenomenon, each of us at first only insofar as his own personality is concerned. It is only some considerable time afterwards, when novelty has given place to habit, that we begin to think of the importance the new fact is likely to have for the community. If in this connection we find it to be of importance for our life and to exert a favorable effect, we call it a "factor of civilization," thus meaning that the new fact assists us in satisfying our vital heads, permeating and ennobling them, with a less expenditure of energy and matter than had previously been possible.

May we in this sense term electricity a factor of civilization, may we assert that it permeates and ennobles our vital needs? Can we prove that electricity, more than any other means at our disposal, enables us to practise economy in the household of the individual, as well as in the household of the nation, and the household of nature?

The existence of modern man fluctuates between work and leisure, between the hustle of business and the quiet of home life. What important part electricity is called upon to play in this connection, a superficial

glance will show. You will doubtless agree with me in saying that a really exhaustive discussion of the influence of electricity on the form of our civilization is neither necessary nor possible in the short time at our disposal. Let it, therefore, suffice, in order to form an opinion, to discuss the fundamental importance of electricity in these fields and to examine a few typical instances. It is only as regards its domestic uses that electricity does not enjoy undisputed recognition; many a prejudice has yet to be overcome, many a distrust to be removed; before the importance of electricity in civilization becomes generally acknowledged in this field which perhaps touches us most closely.

Looking back we see the first important application of electricity in the field of transportation. Electrical telegraphy and later on telephony enabled us to solve the fundamental problem of inter-communication, the overcoming of time and space in a manner such as to satisfy the most optimistic dreams. The safety and rapidity in the transmission of news were thus improved to a degree unknown and hardly thought of, and as all civilization is based on co-operation, which in turn depends on an exchange of views and ideas as rapid as possible, we at once realize the cultural importance of electricity in this field. I have only to remind you of the marvelous rescue of ships in distress by wireless telegraphy, of the rapid and effective aid made possible by electricity in the case of great catastrophes or of the prompt and successful warnings and preventive measures in the approach of epidemics, to show how well electricity is capable of assisting the most primitive and original of all human instincts,

that of self-preservation. So far, however, from being limited to this "defensive" part, it aids most actively in the development of active traffic.

The enormous condensation and increase of traffic produced by the adoption of steam power would not have been possible, had not electricity, by an accurate and rapid transmission of news as well as by other arrangements, such as electric lighting systems, electric loading plants, turn-tables, etc., improved at the same time the conditions under which this traffic is prepared, effected and ensured. Electricity announces the approach of trains and anticipates their departure; electricity controls the signals and regulates the shunts, guides the trains into their paths and bids them stop if there is any danger, in fact, electricity safeguards and controls the whole of traffic, and the fine network of wires it requires on its way has become its nervous system. However, in spite of the undoubted importance of a well-working nervous system for any living organism, this would be dead but for its heart and muscles, powerless without any driving force. Electricity has also been able to undertake this function—at first in tramway operation. Electric tramways more than any other means of communication combine speed and safety, frequency of trains and cheapness of travel. Other important factors are the central regulation (and accordingly high economy) in the production of power, the adaptability to the requirements of traffic, elimination of smoke, soot and dirt, economy of time and possibilities of an adequate separation between residential quarters and centers of business. The same reflections apply to the electrification of trunk railways:

* Abstract of a lecture delivered at the general meeting of the Society of Electricians, Berlin, on December 2d, 1911.

Concentration in power production and accordingly, lower working costs; the noise and dirt are reduced to a minimum, and the work of the personnel is limited to a few manipulations. The speed of travel and the frequency of trains can be increased, and the comfort of travel enhanced; in fact, electricity, more than any other agent, ministers to the satisfaction of our wants with a less expenditure of material, force, and energy.

However, in spite of its undoubtedly important rôle in modern civilization, traffic only fulfils intermediary functions, creating no new values intellectual or material. In order to appreciate the cultural value of electricity we should, therefore, attach more importance to an investigation whether electricity has penetrated and transformed not only the means of communication, but the whole professional life, agriculture as well as industry, commerce and trade, art and science, creating new values everywhere.

To agriculture electricity has proved a boon, eliminating the drawbacks connected with the scarcity of manual labor. Electricity has, in fact, not only yielded a cheap, convenient, and safe means of lighting, but in the electro-motor, supplied an agent working more reliably, rapidly and cheaply than man or animals, which has given rise to the construction and adoption of small and light machinery.

The extent to which electricity now controls agriculture can be inferred from the use of electrical machinery for many operations which had previously been done exclusively by manual labor with a considerable expenditure of time and energy. The adoption of electrical sheep-shearing machines, has, for instance, increased six-fold the output of each operator, while reducing to one sixth the time required for a process so irksome to the animal. Milking is now done mechanically by electric means; thus sparing the animal and insuring a cleanliness and hygienical operation hitherto impossible.

If electricity in these fields has been a useful help-mate, it has become a mighty ruler in the realm of industry and trade. The concentration in the production of energy, simplicity of power transmission and possibility of power distribution down to the smallest units have made possible this victorious career of electricity. The impetuous winds are harnessed to perform regular duty, the sun's heat stored in coal for thousands of years is converted into brilliant light, creative energy, useful warmth; rushing waterfalls are compelled to convert their roaring violence into indefatigable work spent in useful activity, and the very motion of the tide is subjected to its power. Electricity then sends out its servants, through slender wires into towns and villages, houses and yards, factories and laboratories, wherever they may be required.

The present tendencies of specialization and production on a large scale in a series of successive stages have been promoted by electricity, while the reduction in the cost of operation, elimination of manual labor, improvement in the social and hygienical condition of all branches of industry have brought about more powerful developments than had ever been witnessed in so short a time in any field of human activity.

Nor is the electric motor less important to the artisan than to industrial workmen. Many branches of the small industries, which, in view of the powerful development of factories were rapidly nearing extinction, the electro-motor has again placed on a working basis, so that they are able now to keep their own. Whereas

tailors employed in wholesale production formerly delivered at most eight suits per week, electrically operated cutters, electrically driven sewing machines, and electric flat-irons now enable them to earn many times

Sealing Letters by Electricity.

more than previously with less physical exertion and in healthier surroundings.

Bakers have provided for our increased hygienical and social requirements and for the general tendency towards a better utilization of energy, by adopting electrically driven kneading machines. The carpenter, instead of transporting heavy logs into his workshop with a considerable expenditure of time and wages, or working them laboriously by hand on the spot, is now enabled by means of portable electric drills to perform his work on the building site much more rapidly, conveniently and satisfactorily. The same kind of remarks applies to butchers, locksmiths, joiners, in fact, there is no artisan who could not advantageously replace human labor by electric motors, while increasing the output, improving his sanitary and social conditions, and thus raising the standard of his art.

After this appreciation of the influence of electricity on modern industry, we should similarly acknowledge its importance in the field of commerce. All progress achieved by electricity in connection with traffic (by a safe and rapid transmission of news and a considerable acceleration and simplification in the transport of passengers and goods) are, in fact, of the same importance to commerce. The enormous extension, the increase in the volume of business and the simplification

of transactions would not have been possible without the aid of telegraphy or telephony.

Less striking, though of no smaller importance, is the function of electricity in the realm of science. Apart from its own intrinsic interest as a separate branch of science, it has stimulated and led to successful work its older sister sciences, expanding the realm of chemistry and physics, endowing them with new means of observation and more efficient arms, and thus preparing new and important results. Thus, for instance, the discovery of electro-magnetic waves has resulted in the development of wireless telegraphy; then we have such special branches as electro-chemistry, the determination of high speeds and high temperatures, etc. Electricity has furnished the mathematician with new problems, and the lawyer with new tasks. Electricity has not only supplied medical men with new means of diagnosis (X-rays, etc.), but has done direct service in the cure or relief of many complaints.

As in all phases of our daily work electricity is our faithful companion in our leisure time, also telephones have become an all-important factor in our social life, and the modern theater without electricity would be unthinkable. Electricity not only affords safety against fire, but yields a most effective aid to the whole technical service of theaters. The brilliant effects of light and decoration which excite our admiration have been created by electricity, and a new and important theatrical branch, the moving picture show, is indebted to electricity for its very existence.

There is only one important realm of the human activity which is not closely connected with electricity, that of fine arts. It is true that electrical industry has resorted to art in improving its products and that the mutual effects between architecture and electric lighting are becoming more and more intimate.

Among the manifold applications of electricity probably its domestic uses are least appreciated, though the most various electric machines calculated to facilitate household duties have been designed of late years. Not to mention electric lighting and heating, there is the electric kitchen with its manifold advantages. There is the electrically operated vacuum cleaner, electrical flat irons, knife polishers, laundry machines, sewing machines, bread slicers, and many other devices increasing the comfort of our home.

These manifold minor applications of electricity are by no means useless refinements of civilization or manifestations of an undesirable luxury. Each one of them is, in fact, connected with a saving of time, force and energy, and accordingly with an increase in well-being, enabling us more joyfully to do our work and to face more effectually the struggle for life. In fact, the tendency for comfort promoted by the uses of electricity has been a factor of enormous cultural importance in the history of mankind, as those improving their standard and fulfilling their task more speedily are more valuable members of society than those wasting their energy in trifles and performing their work only reluctantly.

Wherever electricity has been adopted, there has been increased safety and efficiency, with less expenditure of material and a substitution of mechanical labor for human and animal muscular work. There is thus an increasing spiritualization of labor which, commenced by the steam engine, has been promoted more and more by electricity, and we must expect this tendency to extend even farther in the future.

Electric Shearing Saves Labor and Spares the Sheep.

Hot Air Douche for Drying the Poodle After His Bath.