Swedenborg also had glimpses of a neuron theory, built upon Malpighi's observation of "glands" in the cortex, which were presumably groups of cell bodies. Leeuwenhoek had seen the smaller individual "globules," none too clearly distinguished from droplets of myelin and other debris. Swedenborg stated that there was no "scarcely visible spherule of the cortical substance" that does not "bring forth a fibre as its own proper path of determination";—"the beginnings of the fibres are indeed as many in number as are the spherules of this substance." Thus he anticipated the demonstration of neuraxons. Dendrites he less clearly adumbrated in the capillaments too fine for red blood to enter, which connect the vessels with the spherules. Each spherule which thus receives and discharges is a "brain in least effigy"—a "cerebellulum."

Swedenborg's recognition of motor areas in the cortex is the acme of these divinations, accounted by Gustaf Retzius, in his presidential address before the Anatomical Congress of 1903, not merely as "recht merkwürdig" but as "wunderbar" and "erstaunenswert."[5] For Swedenborg not only knew that such centers existed, but "on the whole he correctly described their location,"—that for the leg above, trunk in the middle and head below, in the anterior portion of the hemisphere, being related to the body "in an inverse ratio." The historian Neuburger was profoundly impressed.[6] Ramström, seeking to account for this "work of genius," believes that pathological cases, combined with pictures and findings of Vieussens, were the source of Swedenborg's conception.[7] But, as the present reviewer has noted, when Swedenborg declares that the determination of what convolution corresponds with this or that muscle of the body can be made only "per experientiam in vivis animalibus, per *punctiones, sectiones* et *compressiones*" he recommends a succession of procedures that he learned from Baglivi. The latter studied the nerve sheaths in living animals *"varie punctis, resectis, affectisque."*

Retzius intimates that Swedenborg discovered the central canal of the cord and the cerebro-spinal fluid. An easy reference to Burdach would have shown that the central canal was found by Estienne (1545) and that Columbus, Piccolomini, Bauhin and Malpighi had considered it normal; moreover, Swedenborg merely surmised its existence. The cerebro-spinal fluid, as the reviewer finds, was known to Coiter in its usual thin and occasionally thickened condition (1573). Whatever is new in Swedenborg is not labeled as such, and often is buried in fiction and romance, not always "lustrous with points and shooting spiculae of thought":—"The pons is the bed or conjugal chamber or couch for both the brains; for there like a pair of consorts, they join their first embraces and enter into a common covenant for the conception and bringing forth of their nerves."

Swedenborg has made a long story of his progressive study of the brain, nearly all of which is now available in English, included in the following works. On Tremulation, 79 pp.; The infinite, 160 pp.; Three Transactions, 2 vols., 910 pp.; Economy of the Animal Kingdom, 3 vols., 1,381 pp.; The Brain, 2 vols., 1,439 pp.; Animal Kingdom, Part 3, 226 pp. Even when Swedenborg tore vertically in halves eight pages of Latin manuscript and threw one half away, the missing portion has been conjectured and added so that not a line be lost. It remains for some neurologist to discard the quotations, repetitions and revisions, and present Swedenborg's contribution in a form that does not require a Swedenborg research on the part of every reader. For it is clear that Swedenborg deserves an honorable place among the "Apostles of Physiology"—a place that too often has been denied him. Essential for this undertaking are the Three Transactions, now made available by Dean Acton, through his scholarly and devoted labor, in the highly commendable volumes here inadequately reviewed.

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REPORTS

STATEMENT OF CONDITIONS OF THE AMERICAN CHEMICAL SOCIETY

THE American Chemical Society is still growing in numbers, in prestige and in influence, far more so than some of us who have been in closest touch with its progress had any reason to hope. It simply means that American chemists are more and more realizing that the American Chemical Society is their friend, is interested in their welfare, is doing all it can to enable them to develop themselves, and that membership in the society is a catalyst to success. Its efficacy is not

[5] "Emanuel Swedenborg als Anatom und Physiolog auf dem Gebiete der Gehirnkunde." *Verh. d. Anat. Ges.*, pp. 2–14, 1903.

[6] Dr. Max Neuburger. "Swedenborg's Beziehungen zur Gehirnphysiologie." *Wiener Med. Wochenschr.*, Jahrg. 51, col. 2077–2081, 1901.

[7] Martin Ramström. Emanuel Swedenborg's investigations in natural science, and the basis for his statements concerning the functions of the brain. Kungl. Vetenskaps-Societet., Uppsala, 1910, 59 pp., fol.

always appreciated by individuals who lack real professional consciousness.

The society now has 30,400 members, of which slightly over 3,000 have joined in 1942. There has been a loss of approximately 1,000 subscribers to the *Journal of the American Chemical Society;* 1,200 to *Chemical Abstracts;* 1,600 to *Industrial and Engineering Chemistry;* and 1,400 to *Chemical and Engineering News,* in foreign countries to which publications can no longer be sent and from which payment can not be received. In spite of this, on April 1, 1942, the *Journal of the American Chemical Society* had 60; *Industrial and Engineering Chemistry* 431; and *Chemical and Engineering News* 1,481 more subscribers than on April 1, 1941. The subscription list of *Chemical Abstracts,* on the other hand, has, on account of large foreign circulation, decreased 342 between these two dates. Income from subscriptions, since the increase was largely due to subscriptions at the special rates given to members, is so far approximately $7,000 less in 1942 than in 1941 on the same date.

Some of the society's current specific accomplishments for its members, outside of normal procedure, are herewith brought to your attention.

The Committee on the Professional Training of Chemists has collected complete lists of the students in our colleges and has sent a special questionnaire to all these students for registry in the National Roster of Scientific and Specialized Personnel. At this time, the committee has been in session for four days and evenings, continuing its strenuous labors in studying and accrediting the chemical departments of our educational institutions. The society owes the members of this committee a debt of gratitude for accomplishments which are having, and will continue to have, a far-reaching effect on our professional standing and on the quality of the chemists and chemical engineers whose services are in future to be utilized by our country.

The Employment Clearing House is again functioning, and continues to give unusual opportunities to our members for contact with our best employers, thus rendering a service unsurpassed by any professional group. In order that those principles may be implemented, it is open only to employers who agree to the basic principles laid down by the Board of Directors in its action taken at Atlantic City on "Employer-Employee Relationships" (see *News Edition,* Vol. 9, p. 1014, September 25, 1941). A number of firms have written the society, stating that they were carefully revising their lists of employees to be sure that they met at least the minima set by the directors, and a number of firms have stated that they are, and have been, exceeding the recommendations for salaries to graduate chemists and chemical engineers. From the reports coming from our colleges, it is very evident that the young men being graduated this year are receiving distinctly higher offers of compensation than in previous years. Unfortunately, this is not true of all employers and explains in part the number of individuals registering for employment or change of employment in the Employment Clearing House. Practically all those registered are seeking change of employment, the number of unemployed registrants being negligible.

The American Chemical Society Committee on Cooperation with the National Defense Research Committee sent out a questionnaire last December, the results of which were embodied in the article, "The 'Production Army' *vs.* the 'Combat Army,'" which appeared in the February 10 *News Edition.* This, too, has had its influence on a desire for change of employment, but it has been especially helpful in convincing authorities directing the war effort that there is a very serious scarcity of chemists and chemical engineers for the "Production Army," and that replacements for any who may be inducted are almost impossible unless other serious vacancies are created.

Expenses for paper and printing are increasing, the directors having found it necessary to modify the society's contract with the Mack Printing Company to help meet additional costs forced upon the company in connection with labor and materials. Nevertheless, it is anticipated that with the increased support from American chemists we will again be able to balance our budget.

One of the society's most noteworthy accomplishments of the past year was the quite definite establishment of the full professional status of our members and the legal recognition of graduate chemists and chemical engineers as professional men. To-day, full membership in the American Chemical Society is a far better guarantee of professional standing and status than can be given by any state licensing board. Through the interest, encouragement and support given by the American Chemical Society to its members at the Shell Development Company in Emeryville, California, it has been legally established that professional men can not be forced to submit to inclusion in any organization controlled by heterogeneous groups of non-professional men. It is a decision of far-reaching importance to the chemical profession, as outlined in the article on page 165 of the February 10 issue of *Chemical and Engineering News.* The National Labor Relations Board decision, No. R-3245, and briefs containing a compilation of the laws governing these case matters, are available to groups of our members who may be threatened with coercion. All this was promised to the membership when the Committee on Economic Status was appointed. This

committee has been exceedingly active, and its report presented at this meeting, which will be published in detail in *Chemical and Engineering News* and reprinted as a separate document, will bring much important and useful information to the chemical profession.

The secretary's office has been especially concerned with, and active in, problems affecting the proper allocation of chemists and chemical engineers in the country's war effort. It is quite definitely recognized and admitted that the normal place for chemically qualified men is in the "production army," for it is there that true patriotism requires them to serve. Without them, the combat forces simply can not be supplied with the materials and implements of warfare. On the whole, Selective Service has functioned efficiently. General Hershey and his corps of assistants are exceeded in efficiency and intelligence by no other group in the Army or Navy. The local boards are made up of patriotic citizens and, for the main part, of intelligent citizens. It would be surprising if all the 6,600 local boards contained men who were capable of judging the importance to the war effort of graduate chemists and chemical engineers. Many mistakes have been made. Several hundred chemists and chemical engineers, including some with seven years of training and additional years of experience, have been inducted into the Army and are now functioning as stretcher bearers, orderlies, pharmacists' clerks, and in other necessary occupations, but occupations in which high-school graduates could function with equal efficiency. As a consequence, their years of special training and experience are lost to the country. For reasons which no one can explain, there are apparently no channels in the War Department through which this man power can be assigned to chemical work, either in the production or combat armies. The situation is just as serious as if graduates of West Point were assigned to the ranks as privates. All efforts to remedy this situation have completely failed, in spite of the fact that the entire matter has been forcefully presented to high authority. In many instances, also, students of chemistry and chemical engineering have not been allowed to complete their courses, which procedure is certain to deplete future supply should the war continue. These mistakes, however, have been caused by a few of the local boards only, and are not the rule. When appeals are properly made, and when details can be sent in time to Selective Service Headquarters, deferment for service in the "production army" is usually secured. Once inducted, the best trained chemists and chemical engineers are simply "genus homo" and at present nothing can be done toward utilizing their qualifications in the country's service.

In contacting local boards, employers should call attention to Selective Service Memoranda I–347, I–398 and I–405. If the men who have been called in the draft are necessary men in work essential to the national health, safety and interest and to the war effort, the employer should make every effort to see that deferment is allowed. If the local board refuses, the case should be immediately appealed to the Appeal Board. When an appeal is taken but not before, if the employer will send to the secretary's office a copy of Form DSS 42A used in the appeal together with the selectee's number and local board number and address, the case will be referred to Selective Service Headquarters in Washington for such advice and recommendation as the premises may warrant. Such appeals, when justified, have usually been granted. Eliminating previously mentioned errors, chemists and chemical engineers of America, with the exception of the group brought into the Army through their commitments as reserve officers, are serving the nation's war effort where they feel they can serve best.

The American Chemical Society has to-day a list of 60,000 individuals who, at least, believe themselves to be chemists or chemical engineers with data as to the training and experience of each. It has been of inestimable value to the society, and has greatly helped to implement its aid to both the production and combat armies.

CHARLES L. PARSONS,
Secretary

SPECIAL ARTICLES

SOME PRECOCIOUS DEVELOPMENTAL CHANGES PRODUCED BY ADRENAL CORTICAL HORMONES

THE more important functions ascribed to the adrenal cortical hormones are their ability (a) to maintain life, (b) to maintain at normal the carbohydrate levels in the tissues and (c) to maintain at normal levels the sodium, potassium and water balance in adrenalectomized animals. On the other hand, excessive amounts of these hormones may be presumed to be present in patients with adrenal cortical tumors, who may show marked bodily changes, the most pronounced of which are modifications of the sexual characteristics. These are attributed to the endocrine secretions of the tumor, among which have been identified several of the sex hormones (Reichstein, Kendall). When these tumors occur in fully grown adults, it is difficult to delineate changes other than those upon the sexual functions. However, in