the idea of an antagonism between animals and plants could be extended to the subject of diseases and their treatment. Quoting from Dr. Shaw's communication, we read:

> When we consider the infestations of an animal host with animal parasites, we have a markedly different picture. The host and parasite live together without any marked protective or offensive action on the part of either. When death occurs in these conditions, it is a result of the gradual destructive action of the parasite on some particular tissue of the host. The tapeworm, the liver fluke, the malarial plasmodium, the trypanosome, the filaria worm, the spirochete and the intestinal ameba may be taken as examples of this type of infesting organism. These organisms do not produce any great amount of toxins, and do not stimulate the host to form any great amount of protective substance.

I am writing the present note in order to corroborate with actual experimental data the conclusions he arrived at as a result of his lucid and logical reasoning. During the past year I have been investigating by my special phytopharmacological methods specimens of blood from two kinds of parasitic diseases. In one series of experiments, I have been examining the toxicity for plant protoplasm of blood from cases of malaria. Some of these specimens were obtained in the United States; other specimens, more particularly those from cases of virulent fever, were obtained through the courtesy of Professor R. N. Chopra, of the School of Tropical Medicine, Calcutta. The results of these experiments indicate that, as far as the phytopharmacological tests are concerned, malarial blood contains little or no toxin of any kind. Another series of experiments is at present being carried on by me in collaboration with Dr. O. R. McCoy, of the department of helminthology, Johns Hopkins University School of Hygiene and Public Health, on bloods obtained from dogs infested by the hookworm. These animals exhibit the picture of extreme anemia, and it was deemed desirable to inquire whether this anemia was of a pernicious type. Although these experiments are still in progress, the data already in hand indicate that the blood serum of dogs with hookworm shows no toxicity and behaves exactly like blood from human beings suffering from severe secondary anemias. These lines of investigation give a striking proof of the correctness of Dr. Shaw's reasoning in regard to infestations of an animal host with animal parasites.

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THE FIRST ENGLISH POPULARIZER OF SCIENCE

PERHAPS other readers of SCIENCE might be as interested in examining Oliver Goldsmith's "A History of the Earth and Animated Nature" as was the writer, who recently, through Mr. Carter Bishop, of the English department of West Virginia University, was lent an old edition of this work. This particular edition, in two volumes of more than 1,000 large pages, was published in 1853 by A. Fullerton and Company. In this edition, more than fifty years later than the first edition, the editors claim to have corrected many errors of the original work.

In the publishers' advertisement at the beginning of the work they say that Goldsmith is the "first English writer who, by the inimitable graces of his style and manner, threw a charm over the subject which was new to the English reader, and the effect of which, in rendering the science of Natural History popular, has been great and extensive."

Besides the "inimitable graces of his style" the book is illustrated with numerous colored plates, some of which are really good. The classification, though of course antiquated, is in some cases not so much out of date as might be expected of a work written 150 years ago—Goldsmith died in 1774.

In the chapter on "The Crocodile and its Affinities" he mentions the four chief types of modern texts: the crocodile, the alligator, the cayman and the gavial. He tells many interesting things about the various members of the group, some of which details are undoubtedly true, some of which are doubtfully true and some of which—for example, the "open-bellied crocodile" that carries its young in an abdominal pouch—are obviously fiction.

Altogether the book is most interesting, if *not* to be recommended for general consumption by the non-scientific public.

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QUOTATIONS

MEDICAL PATENTS

A REPORT has recently been issued by a Committee of the Association of British Chemical Manufacturers (London, November, 1929) suggesting alterations to the Patent Laws in respect of chemical inventions. Many of these suggestions will be welcomed by chemical workers as safeguarding their interests and those of the general public, and as simplifying procedure.

A large proportion of the report, however, is devoted to the question of "medical patents," *i.e.*, the patenting of chemical substances intended for the alleviation and cure of disease, and the committee make

certain recommendations of a revolutionary character to which I will refer again later. At the present time research work is in progress all over the world on the production of synthetic organic substances, often of very complex structure, and demanding the highest degree of chemical skill and knowledge for their production; one has only to recall the past successes of the chemist, such as aspirin, phenacetin, antipirin, novocain, stovain, salvarsan, "germanine," synthetic adrenaline, tryparsamide, and many others, to realize how deeply indebted is the medical profession to the work of the modern organic chemist. In some cases these products have been discovered as the result of researches by individual chemists working in conjunction with a pathologist; in other cases the results have been due to team work in which many chemists have been employed.

An examination of the patent literature indicates that until recently the patentees were predominantly German or Swiss firms, who, by obtaining patent protection for their discoveries, were able to develop them on suitable technical lines, bring them to the notice of the medical profession, and thus cover the heavy expenditure in time and money involved in such work by the sale of the successful patented article. Actually, however, there is no very great profit in such work, as the percentage of "bull's eyes" is very small and often only just enough to help to pay for the expenditure of ammunition involved. In fact, to continue the analogy, such work is rather like firing at a concealed target with a machine-gun; sooner or later an "inner" or a "bull" will be registered, but it necessarily involves a heavy expenditure of ammunition, and a firm or private investigator can afford to continue such investigations only if he is reasonably sure of some measure of protection when he actually succeeds in obtaining a direct hit.

When one considers the untold suffering which has been avoided by the use of, say, the synthetic local anaesthetics such as eucain or novocain, the hundreds of thousands of lives which have been saved by salvarsan (for venereal diseases), by acriflavine (for septic wounds), by germanine and tryparsamide (for sleeping sickness), it will be realized that humanity and the medical profession are under a very great debt to organic chemists. Recently, for instance, in French Congo, a case was quoted of a village of 126 natives of whom 83 were infected with sleeping sickness and doomed to a terrible and lingering death, while others were in a moribund condition: a year later, chiefly as the result of injections of tryparsamide, all these 83 patients were free from infection and fully convalescent.

Research work of this nature should obviously be encouraged in every way, but the report in question proposes a plan calculated to impede and discourage all further independent chemotherapeutic work in this country. It is seriously suggested that it is unethical for a chemist or medical man to receive any reward for his services in this direction, and that, if he is fortunate enough after months or years of work to discover a new curative agent, antiseptic, bactericide, or the like, and applies for patent protection, he shall be forthwith deprived of all his existing legal rights in this, as though he were an outlaw, and these rights shall be handed over to a new government official, the "Medical Patents Trustee," who will arrange for the manufacture of the product, settle terms of royalties, etc. Any such fees or royalties will be retained by the Medical Patents Trustee, who may, in his discretion, repay out-of-pocket expenses in connection with the investigation (and any one who has had to argue costs before a taxing master will realize the hopelessness of obtaining from any bureaucrat a sum anything near the actual cost), and any balance will be devoted to further research. In other words, the unhappy chemist must pay for all unsuccessful research from his own pocket, and when after long and arduous work he attains a successful result his success is to be snatched from him by a medical bureaucrat and devoted to purposes over which he has no control. "Heads I win, tails you lose." In other words, it is perfectly ethical for a chemist to devote his energies to the invention of new steels for armor plates and shells, of new poison gases or of new explosives for the destruction of his fellow men; but as soon as he is so unwise and so unworldly that he prefers to devote his skill towards the alleviation of human suffering, then he is at once to be penalized, and, for all the encouragement given him, he and his family may starve, while the manufacturers and merchants who market the product make their profit and the consultant who enhances his reputation by the successful cures with the new drug may charge whatever fees he feels right.

The whole scheme is fundamentally unjust, illogical, unworkable and contrary to the public interest, as instead of encouraging firms and individuals to carry on research in chemotherapy such work will inevitably slow down and cease except in so far as it may be carried out in government-controlled laboratories. There is, however, a very real danger that the weight of opinion of a vociferous, unenlightened and obscurantist portion of the medical profession may succeed in getting such an ill-advised scheme seriously considered and even smuggled through Parliament, and thereby set back the progress of chemotherapeutic research in this country for decades, while other nations with less distorted views continue to encourage

and assist chemists and medical research workers in their humane endeavors, for in this field no less than in others the laborer is worthy of his hire. No one familiar with the situation in this country in the early days of the war can fail to understand the seriousness of the present attack upon chemotherapeutic research.—Frederick A. Mason, College of Technology, Manchester. *The London Times.*

SOCIETIES AND MEETINGS

THE NORTH CAROLINA ACADEMY OF SCIENCE

THE twenty-ninth annual meeting of the North Carolina Academy of Science was held at Duke University, Durham, on May 9 and 10. Papers were presented before the general section of the academy on Friday morning and afternoon. Following the presentation of papers and the business meeting on Friday afternoon, Duke University served the academy a picnic supper on the new Duke campus. Friday evening the retiring president, Dr. J. B. Derieux, professor of physics at State College, gave his presidential address on "The Corpuscular Theory of Radiation and the Wave Theory of Matter." After this an informal reception was given the academy by Duke University. Saturday morning the academy met in the following sections: General section, chemical section, mathematics section and physics section. Seventy-seven papers and five exhibits were on the program. (Abstracts of most of them and complete papers of several will appear in an early number of the *Journal of the Elisha Mitchell Scientific Society.*)

The executive committee reported the election of thirty-four new members during the year and the reinstatement of four former members. Dr. F. P. Venable, professor of chemistry of the University of North Carolina, was made an honorary life member as a token of appreciation for his services to the academy, to science and to his state. Dr. Venable has been a member of the academy since the year of its origin, 1902, and is this year retiring from active duty after fifty years' service at the University of North Carolina (professor of chemistry, 1880–1900; president, 1900–1914; professor of chemistry, 1914–1930). Two hundred and twenty-eight registered at the meeting.

Mr. Calhoun Pruitt, a student of the Monroe High School, was declared the winner of the High School Science Prize, a silver loving cup, for the best essay presented by a high-school student. Essays for 1930 were confined to the fields of chemistry and physics.

The officers elected for the year 1930–31 were:

GENERAL ACADEMY

President, W. F. Prouty, University of North Carolina.
Vice-president, P. G. Ginnings, Greensboro College.
Secretary and treasurer, H. R. Totten, University of North Carolina.
Executive committee, the above officers and F. A. Wolf, Duke University; Bert Cunningham, Duke University; W. L. Porter, Davidson College.
Representative to the A. A. A. S., W. C. Coker, University of North Carolina.

CHEMICAL SECTION

Chairman, T. A. Bigelow, Duke University.
Vice-chairman, A. J. Wilson, State College.
Secretary-treasurer, H. D. Crawford, University of North Carolina.
Councilor, L. G. Willis, State College.

MATHEMATICS SECTION

Chairman, W. W. Elliott, Duke University.
Secretary, E. L. Mackie, University of North Carolina.

PHYSICS SECTION

Chairman, A. A. Dixon, State College.
Secretary, W. E. Speas, Wake Forest College.

The thirtieth annual meeting of the North Carolina Academy of Science will be held at State College, Raleigh, in the spring of 1930.

H. R. TOTTEN,
Secretary

SCIENTIFIC APPARATUS AND LABORATORY METHODS

A BELT PAPER KYMOGRAPH WITH A THREE SPEED GEAR SHIFT

THE recent appearance in SCIENCE[1] of an article describing a commercially built kymograph with a multirange gear shifting device has prompted the writer to describe a kymograph provided with a speed reducer and a gear shifting device which was built by junior and senior college students in mechanical engineering.

For more than a decade the writer has been interested in belt paper kymographs and has frequently studied published diagrams as well as observed those in operation. Therefore, about four years ago when called upon to design an electrically driven belt paper kymograph it was thought best to construct the machine as herein described.

[1] Porter, Roy and Vianey, "An Electric Kymograph," SCIENCE, 71: 41, January 10, 1930.