TABLE 1

RESPONSE OF HYPOTHYROID, NORMAL, AND HYPERTHYROID RATS TO ROENTGEN RAY IRRADIATION

Group	Mortality ratio 30 days*	Appproximate LD_{25} day†	Percentage survival	Effect of medication on rate of mortality
Normal (control)	9/20	12.9	55	None
Thiourea	9/20	11.0	55	Increased
Thiourea and thyroxin	11/20	9.0	45	"
Thyroxin	9/20	11.8	55	"

* Mortality ratio = number dying/total number in group.
† LD_{25} day = day on which 25% of the animals were dead.

over a longer time interval prior to roentgen ray irradiation.

Male CFW rats weighing 140–179 g (average 155 g) were placed on Rockland rat diet and given 0.1% thiourea in drinking water for 37 days prior to irradiation. This was the time interval in which the animals reached a weight plateau. All animals were weighed weekly. They were arranged in groups of 20 as follows: Normal controls, thiourea controls, thiourea-irradiated, thyroxin controls, thyroxin-irradiated, thiourea-thyroxin controls and thiourea-thyroxin–irradiated. The thyroxin animals received 0.1 mg/animal/day Squibb thyroxin by intraperitoneal injection for 5 days before irradiation, and all of them showed the hyperexcitability and small weight loss usually observed after thyroxin medication. All animals in the irradiated groups were subjected to 600 r acute whole-body roentgen ray irradiation, administered with a 250 KVP Picker Industrial Unit calibrated before the experiment with a Victoreen Thimble r-meter. The technical factors were: 250 KVP; 15 ma; TSD 100 cm; filters: 0.21 mm Cu inherent, 0.5 mm Cu parabolic, and 1.0 mm Al; HVL 1.85 cm Cu; size of field, total; r/minute measured in air 9.9. Uniformity of dosage was assured by rotating the radiation cage during treatment. After irradiation the animals were maintained on their usual diet and received no further medication. Autopsies were performed upon all animals dying during the 39-day experimental period and upon all survivors at the end of that time. The usual signs of irradiation injury (diarrhea, bloody stools, petechial hemorrhages, pale mucous membranes, etc.) were observed in the irradiated groups. Gross examination of the thyroids in the animals medicated with thiourea alone showed the usual signs of antithyroid medication, whereas those that received thyroxin in addition to thiourea had normal appearing thyroids.

The average daily fluid intake per rat was 19 ml, equivalent to 19 mg thiourea. Table 1 indicates that ingestion of this amount of thiourea gave no protection. The slight increases in the rate of mortality seen with both the thiourea- and thyroxin-medicated groups were actually not significant. However, the increase in the mortality rate observed in those animals that had received both thyroxin and thiourea was significant. Inasmuch as none of the medicated nonirradiated control animals died during the experimental period, it appears that the lethal effects in the irradiated medicated groups were due to the irradiation received. However, there does appear to be a synergism between the irradiation and both the thiourea and the thyroxin insofar as the rate of mortality is concerned. Furthermore, it is quite evident that thiourea-induced hypothyroidism affords no protection against roentgen ray irradiation lethality.

Comparison of the results herein presented with those of Limperos and Mosher (*1*) and Mole *et al.* (*2*) indicates that the potential sulfhydryl group in the thiourea molecule is available, but a huge excess of thiourea must be present for protection against the lethal effects of roentgen ray irradiation. This would be in accord with the observations of Patt *et al.* (*3*) concerning glutathione and cysteine protection of irradiated animals. Further investigation of compounds containing potential sulfhydryl groups is now in the process of completion and will be reported in detail elsewhere.

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Should a "Law of Recency" Be Added to the International Code of Zoological Nomenclature?

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Proposal, counterproposal, and debate on zoological nomenclature have been presented in numerous zoological periodicals during recent years. Basically analyzed, the literature appears to represent a clash of opinion between two groups: those who feel that it is desirable to follow strictly Article 25 (the law of priority) and limit the commission's use of plenary powers, and those who advocate more extensive use of the plenary powers by the commission, with less strict application of Article 25.

Individuals in both groups admit that, at present, the procedures used are confusing and unwieldy. Each side concedes that there is some merit in the other's case. It is not the intention of the writers to enter into this debate; opinions of the two schools are perhaps irreconcilable in this generation.

The writers do feel, however, that constructive thought should be given by all zoologists to ways of preventing similar confusion in the future, especially by eliminating the words, too frequently found in the *Opinions* and the proposals in the *Bulletin of Zoological Nomenclature,* that such and such action "would clearly result in more confusion than uniformity." The debates being waged in all zoological literature

about the status of names clearly indicate that confusion is not entirely a matter of the future, but a real concern of the present.

An examination of the sources from which this confusion has arisen reveals that the important ones are:

1) Lack of knowledge of the existence of a publication;
2) Lack of knowledge of the exact date of publication;
3) The "dragging-out" of questions by different schools of thought arising from differences in interpretation of the Code and its applications;
4) Deliberate refusal to give up a name once it has been learned—i.e., deliberate failure to apply the law of priority and maintaining that its application will create "confusion."

Perhaps errors made in the past can be corrected only by rulings such as those being made by the commission under its plenary powers. But what about the future? Is the commission to continue to use its plenary powers indefinitely (or be forced to do so by allowing the same causes of confusion to continue to exist)? Is the commission to rule on its rulings as it apparently must do with the Meigen 1800 paper (*1*)?

It is evident that something is wrong when the commission has to use its plenary powers so often. There is a need for practical working procedure in nomenclature to avoid multiple use of names, especially at generic and suprageneric levels. The writers believe that if stability is ever to be obtained in the use of scientific names a "law of recency" must be added to complement the law of priority. Once a name is rejected it should not be used again as a valid name unless there are definite reasons for so doing and they are given in publication. The proposed "law of recency" might be stated as follows:

> The names used in the most recently published article dealing with the taxonomy or nomenclature of a group or species shall be regarded as authoritative *until further publication is made* reorganizing or otherwise disposing of the names involved and *giving the reasons why the changes are made.*

The need for such a law can be amply demonstrated. For instance, in 1915 Gahan (*2*) definitely synonymized many generic names with *Opius* Wesmael. In 1943 Hincks (*3*) wrote:

> *Bracon carbonarius* Nees, 1834, is designated as the genotype of *Opius* by Westwood (1840). This species is also the type of the monobasic genus *Biosteres* Foerster, 1862. For the present it will be better to transfer the whole of the species now grouped under *Biosteres* to the genus *Opius* until such time as an examination of the species leads to a regrouping. There are rather a large number of generic names available in this section, but it is evident that Gahan (1915) regards the divisions as of little generic value.

While Mr. Hincks' action appears to be correct, it illustrates the necessity of the proposed "law of recency," which would *compel* the transfer of the names in *Biosteres* to *Opius* and the acceptance of the synonymy given by Gahan until such time as the group was revised and *the reasons published* for changing the system used by Gahan.

The confusion that has existed with regard to *Bracon* Fabricius, *Cremnops* Foerster, and *Microbracon* Ashmead also illustrates the case in point. In 1917 Gahan (*4*) transferred the name *Bracon* to replace *Cremnops*. This name change was accepted in North America but rejected in Europe. Finally, in 1935, the question was decided by the International Commission, but the results were not published until 1943.

Although illustrations have been drawn from the family Braconidae, numerous other examples could be given—e.g., *Agrion* versus *Calopteryx* (*5*). Undoubtedly any taxonomist can readily cite similar cases in his particular field of interest.

At the present time, refusal to accept published synonymy is responsible for differences in accepted nomenclature between different groups or individuals. Such refusal and the resulting difference in accepted names mean that the cataloguer must constantly change species from one generic name to another and back as new articles appear—or carry the synonymy where he wishes, using his own interpretation in order to place the species in the "proper" place in his catalogue. The other alternative is to carry the species under several genera at the same time. In either case the situation produces much confusion and additional labor rather than stability.

Where does this leave the cataloguer? In the first illustration mentioned, is Gahan's synonymy to be accepted? Or are we free to ignore all but the original descriptions? Should the individual have the right to be "conservative," reject the published work of others (perhaps by merely ignoring it or dismissing it by stating that it is incorrect) and continue to use names that have been synonymized by others? For example, is Whiting's continued use of *Habrobracon juglandis* (Ashm.) valid?

The writers believe that the adoption of such a "law of recency" would aid in lessening the confusion created by sources (3) and (4), since points of disagreement would be brought to the fore where they could be acted upon by the International Commission when necessary, resulting in a much more rapid stabilization of names than occurs under the present system.

Incidentally, the lone expression "in the opinion of the writer" does not convey the extent of similarity or difference existing between organisms and perhaps should not be regarded as a valid reason for changing the established status of a name. The same objections may be raised against "new synonymy" or "new combination" when used without descriptions of similarities or differences.

To eliminate sources (1) and (2) it is suggested that names and their changes be considered as fully validated only after appearing in the *Zoological Record,* that for validation purposes the author be required to send a copy or facsimile reproduction of his publication to this source, giving the date on which the article in question was distributed (i.e., "published"), and that this date be included after the ref-

erence in the *Zoological Record* under the "Titles."

Such a procedure would eliminate the question of the date of publication serving as a source of future trouble. That the publication date is still a source of confusion is illustrated by the fact that Sabrosky (*6*) found it necessary to publish a note regarding the date of "publication" of an article distributed as late as 1948.

It also appears desirable to provide for continuing international support (perhaps through Unesco or some similar means) for the *Zoological Record* and to insure sufficient funds so that an adequate staff may be maintained to produce a new volume within the year following that with which the volume deals.

It would be the authors' suggestion that the plenary powers of the International Commission be terminated at the point where the names and dates are first validated in the *Zoological Record*; i.e., that the plenary powers not extend to names to be published in the future and that a date be set at which the application of the law of priority becomes rigid.

Since it is only through stabilization of the International Code and the procedures to be followed that nomenclature can be placed on a sound basis, the suggestions given are presented as a constructive criticism rather than from any derogatory motives. The authors would welcome both private communications and published discussions of the ideas herein submitted.

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Ultraviolet Absorption Spectra of Proteins

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Studies of the absorption spectra of proteins in the ultraviolet have led to the demonstration of bands associated with tyrosine, tryptophan, and phenylalanine (at about 280 mμ). In view of the results of the studies on fatty acids (*1, 2*), it seemed that in the region of 180–200 mμ a band might be present that would be representative of the peptide bonds. Through the courtesy of J. R. Platt we were able to confirm this conjecture by the finding that bovine serum albumin had a rather broad band with a maximum at about 190 mμ. To confirm that this band was also typical of simple peptides, glycylglycine and triglycine were also studied and gave the curves shown in Fig. 1. The complete quantitative data for bovine albumin are not available at this time, and this curve is not included, although a rapid analysis of the plates led to the above observation of a maximum.

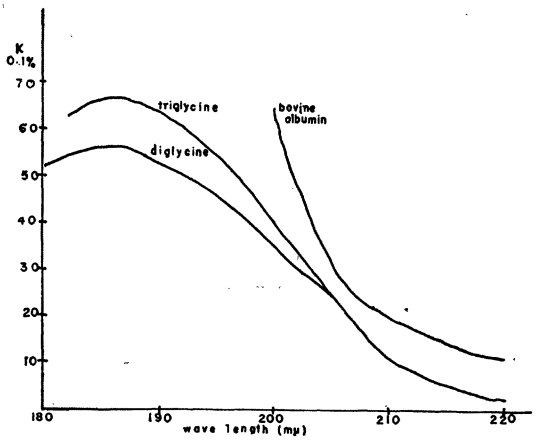

FIG. 1. Absorption spectra of bovine plasma albumin, diglycine, and triglycine.

A study of Ley and Arends' (*1*) data, as well as our own, on amino acids showed that near and above 205 mμ—i.e., on the shoulder of the curves—the absorptions of amino acids are of a much lower order of magnitude than the values for proteins and peptides. At lower wavelengths the absorption of the amino acids rises very rapidly, and near the maxima for peptides and bovine albumin amino acid absorption approximates, and is higher than, the absorption of peptide and protein. Since it is believed that the side chains of the constituent amino acids would make a definite contribution and corrections would be necessary, it was decided to obtain data for proteins for the region sufficiently high on the band and at the same time at wavelengths at which the amino acids absorb slightly. This region lies above 200 mμ.

The specific extinctions of several proteins and peptides were determined at 205 mμ. The specific extinction was multiplied by the molecular weights and divided by the number of peptide bonds (*3*). This gave a series of peptide extinctions (Table 1).

TABLE 1

PEPTIDE EXTINCTION FOR PROTEINS AND AMINO ACIDS

Compound	Peptide extinction (205 mμ)
Bovine albumin	2,580
Egg albumin	2,785
Gelatin	3,050
Glycylglycine	3,300
Triglycine	2,340

The agreement between the various proteins is fairly good, and all the values fall within the order of magnitude of each other. The values for the proteins are not considered rigidly assigned values for a peptide bond but rather as a statistically averaged value of the individual peptide bonds. This is confirmed by a series of studies (*4*) of simple di- and