as to obtain the complexes consisting of the sugar and bases. Such complexes are known by the name "nucleosides."

In the development of the theory of structure of the plant nucleic acid the nucleosides played a very important part inasmuch as they made it possible, on one hand, to explain the order of union between the individual components of the nucleotides, and, on the other, they afforded a way of isolating in pure state the sugar entering in the structure of the plant nucleic acid. It is evident that the isolation of the nucleosides from the thymonucleic acid will play an analogous rôle in the development of the theory of the structure of thymonucleic acid.

One of these nucleosides has now been isolated in perfectly crystalline form, free from mineral impurities. It is optically active; on hydrolysis it gives rise to a reducing substance and to the base guanine. The reducing substance does not form an osazone under the usual conditions. With Kiliani's reagent the substance gives a greenish-blue coloration which on standing turns to purple. The color is not identical with that described by Kiliani for his desoxysugar. The composition of the nucleoside, however, suggests the possibility of the sugar being either an anhydro- or a desoxyhexose. The theory of the guanine nucleoside of an anhydrohexose requires the following composition: C = 44.74, H = 4.41, N = 23.73. The analytical results found for our substance are C = 44.43, H = 4.41, N = 24.65. The slight discrepancies between the theoretical and the found values are easily explained by a slight admixture of the free base, inasmuch as it is known that nucleosides have a tendency to form complex salts with the free bases.

We request workers in the field of nucleic acids to leave for some time to come further work on this substance to our laboratory.

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*THE SPECTRUM OF IONIZED XENON (Xe_{II})

EXTRAPOLATING the separation of the lowest doublet ($^2P'_{2,1}$) of the spark spectra of the preceding rare gases, arising from the s^2p^5 electron configuration, has made possible the estimation of this separation in the first spark spectrum of xenon. The data of Abbink and Dorgelo[1] in the Schumann region have been examined and the doublet separation has been found to be 9621 wave-number units. The most probable classification of the combinations in this region of the spectrum is as follows:

Combination	λ	ν
$(s^2p^5)^2P_2' - (s^2p^4 \cdot 4s)^2P_1$	824.83	121237
$(s^2p^5)^2P_2' - (s^2p^4 \cdot 4s)^2P_2$	854.71	116999
$(s^2p^5)^2P_1' - (s^2p^4 \cdot 4s)^2P_1$	895.92	111617
$(s^2p^5)^2P_1' - (s^2p^4 \cdot 4s)^2P_2$	931.25	107383
$(s^2p^5)^2P_2' - (s^2p^4 \cdot 4s)^4P_1$	1003.36	99665
$(s^2p^5)^2P_2' - (s^2p^4 \cdot 4s)^4P_2$	1051.93	95063
$(s^2p^5)^2P_2' - (s^2p^4 \cdot 4s)^4P_3$	1100.46	90841
$(s^2p^5)^2P_1' - (s^2p^4 \cdot 4s)^4P_1$	1110.62	90039
$(s^2p^5)^2P_1' - (s^2p^4 \cdot 4s)^4P_2$	1170.43	85439

There is some evidence of other combinations both in this region and in the visible spectrum. The interval between the terms tentatively named ^4P and ^2P is abnormally large, and, although the identification of the former is fairly certain, the final interpretation of the latter is reserved until further data are available. Work is now in progress on a complete description and classification of the spectra of xenon. The authors are expecting to make a further report as soon as the investigation can be completed.

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THYROID-FED RATS AND HIGH ROOM TEMPERATURES[1]

DURING the progress of some experimental work on the effects of feeding desiccated thyroid glands upon the reproduction and lactation of the white rat, the results of which will be published in another journal, one experiment was terminated suddenly when all the thyroid-fed rats died as the result of room temperatures of 88° and 92° F.

A search through the available literature showed that Korenchevsky[2] had reported that "after long excessive thyroid feeding, warming may even be followed by a lethal overheating with a rise of body temperature to 43.5° C."

In view of the fact that 92° F. (33° C.) is considerably less than Korenchevsky's lethal temperature of 43.5° C., it was thought that it would be worth while to publish the following report at the present time.

We had found that, if the dosage of desiccated thyroid was increased a definite amount each time a female rat gained twenty-five grams in body weight, many of her litters were born dead and normal lactation was so interfered with that many or all

* Publication approved by the Director of the Bureau of Standards of the U. S. Department of Commerce.

1 J. H. Abbink and H. B. Dorgelo, *Zeits. f. Physik*, 47, 221 (1928).

1 This research was aided in part by a grant from the Committee on Problems of Sex of the National Research Council.

2 V. Korenchevsky, *Journ. Path. and Bact.* 29: 461–472, 1926.

of the young died before they were old enough to wean. We had also found that thyroid feeding increased the mortality of the females, since many of them died during or immediately following parturition. In order to study certain phases of the problem we planned an experiment in which the amounts of thyroid fed would be much larger than in the previous experiments.

Two litters of albino rats were selected for the experiment. Each of the litters at the time of birth had been reduced to two males and four females. When they were twenty-one days old they were weaned and divided into two groups, one male and two females from each litter were kept as controls and the other male and two females in each litter were fed thyroid gland. The controls averaged 45.6 grams and the thyroid-fed rats averaged 47.6 grams at the time of weaning when this experiment began.

The diet fed to the rats was a modification of the diet used by Dr. J. R. Slonaker. It consisted of:

	Grams
whole wheat flour	65.0
casein (commercial)	15.0
powdered whole milk	10.0
sodium chloride	1.0
sodium carbonate	1.5
screened alfalfa meal	3.0
Lilly's cod-liver oil	10.0

The dry ingredients were mixed and then thoroughly stirred with the cod-liver oil and finally ground through a meat chopper or worked through a wire strainer.

In addition to fresh water and the diet described above, all the rats were given each day a small piece of milk-soaked whole wheat bread on which was placed the desiccated thyroid gland before giving it to a thyroid-fed rat. In order to make sure that the rats ate the thyroid and bread, each rat was placed in an individual cage until the bread or bread and thyroid had been eaten. Each rat was then weighed and returned to its cage.

The amount of thyroid fed according to the body weight is shown in Table 1.

A daily record of the maximum and minimum temperatures was kept and the lowest temperature recorded (electric heaters were used when necessary) was 56° F., and the highest was 83° F., until April 27, 1928, when the temperature in the room rose to 88° F., and the day was cloudy and sultry (high relative humidity). Between four and five P. M. on that day two of the "thyroids" died. One week later, an May 4, when the temperature rose to 94° F., the remaining four thyroid-fed rats died. In addition to these six deaths four other "thyroids" from another experiment died on these two days, one female died on April 27 and two males and one female died on May 4, but not a single control animal died!

TABLE 1

SHOWING DAILY DOSAGE OF DESICCATED THYROID ACCORDING TO BODY WEIGHT

Body weight (grams)	Amount of desiccated thyroid fed (grams)
50 to 100	.025
100 to 125	.050
125 to 150	.075
150 to 175	.100
175 to 200	.125
200 to 225	.150
225 to 250	.175
250 to 275	.200
275 to 300	.225
300 to 325	.250

On April 27 the rats were ninety-one days old and the "thyroids" had received sixty-seven consecutive doses of desiccated thyroid (Armour and Co.). The amount of each dose had varied according to the body weight, see Table 1. On that date the control males weighed 358 and 406 grams and the females averaged 245 grams as compared with the weights of the "thyroid" males of 234 and 270 grams, and the "thyroid" females averaged only 203.5 grams.

The relatively high temperatures on these two days seemed to be the cause of the death of the ten thyroid-fed rats because five of them were observed to be in respiratory distress just before they died. Respiration appeared to be very difficult and when water was sprinkled by hand upon three of these prostrated animals they were temporarily relieved, but they died when the cooling effect of the evaporating water had disappeared. Autopsies showed that the spleen and kidneys particularly were affected. Yellowish-gray spots of various sizes appeared on the ventral surfaces of the kidneys and the ventral surface of the spleen was black in all of the rats. The blackened area extended from the tip of the spleen and covered as much as one third of the ventral surface of these organs, which were hypertrophied, as were the liver, kidneys and suprarenals. With the exception of one animal in which there had been a severe hemorrhage so that the thoracic cavity had filled with blood, the lungs and the digestive tracts of all of the animals appeared to be normal.

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