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The chemical nature of insulin.

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For the past two years we have suspected that the tendency to look upon insulin as a simple chemical compound might be erroneous, and that the diminution of the unit dose does not mean a purification in the strict sense, but rather a splitting off of some inactive amino acids. This conclusion was reached from the extremely small content of chlorine in the insulin hydrochloride. Some time ago we had a second proof that our contention is right. In studying the chemical composition of the insulin compound obtained with naphtol yellow S, or its sodium salt, it has been found that fairly pure preparations of insulin, containing about 10 clinical units to a milligram (impure insulin gave unsatisfactory results), give a precipitate with naphtol yellow S, the filtrates being absolutely inactive. The insulin compound is insoluble in water and glacial acetic acid, but soluble in dilute acetic acid and soda solution. It can be injected into rabbits with typical insulin action in the form of the sodium salt, which does not become inactive even on standing in alkaline solution. The activity is destroyed by trypsin. Judging from the content of naphtol yellow S in the compound we can imply that the molecular weight of insulin is about 700. On analysis, the ratio of nitrogen to sulfur was found to be 11:1. This means that in free insulin it would be N:S = 20:1. It seems, at present, that there is but one sulfur atom in the insulin molecule. The chemical nature of insulin is perhaps that of a complicated polypeptide. The data dealing with the recovery of free insulin from the compound, and full analytical results, will appear shortly.

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