really exist today. The scientist is, in spite of himself, involved in public questions simply because science today so largely determines the issues of peace or war, prosperity or poverty, and health or disease.

The traditional reluctance of scientists to become involved in any issues irrelevant to their own work does not apply in the case at issue. The present issues are not irrelevant to the contribution of their work to the public good. Therefore, it is to be hoped that large numbers of scientists will make their views known to their own congressmen and senators and to the Armed Services Committee of the Senate and the Military Affairs Committee of the House of Representatives.

A constructive proposal that could be made to these committees is that a special national scientific manpower service board might be set up within the Selective Service System which would implement policy under the general directives of the Act of the Congress and would serve as a uniform national appeal board. The Act of the Congress should direct Selective Service to provide mechanisms for serving the long-term interests of the country with respect to scientific manpower, in view of the self-evident fact that we are in a situation of long-term, as well as short-term, crisis.

The Congress must be informed by knowledgeable persons if it is to act wisely. Scientists are obviously in the informed segment of the population with regards to scientific manpower problems. It is time for them to speak as individuals, as well as through organizations, because individuals vote and because widespread individual attention to a problem indicates real interest and concern.

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28 March 1955

New Apparatus for Prolonged Constant Infusion in the Unrestrained Animal

During the course of studies on the role of various hormones in the regulation of carbohydrate metabolism, it became necessary to perfuse the unanesthetized, unrestrained dog continuously and intravenously for periods of 1 to 3 mo. Current methods (*1*) involve the use of expensive perfusion pumps, which function satisfactorily for short periods of time but may not be adequate for prolonged continuous use.

The purpose of this communication is to describe an inexpensive, simplified infusion apparatus, recently devised in this laboratory, that does not require a pump and contains a minimum number of moving parts.

The apparatus consists of an infusion reservoir, an electronic resistance relay, a stainless steel solenoid valve, a control reservoir, and a micrometer valve (Fig. 1). The infusion reservoir consists of a series of standard infusion bottles (Abbott). These bottles supply the control reservoir through a stainless steel solenoid valve (General Controls K-21 F) with plastic fittings for tube adaptation. The level of the fluid in the control reservoir is maintained constant (2-mm variation) by two control electrodes (glass with platinum tip) that actuate the electronic resistance relay controlling the solenoid valve. The relay is commercially available (General Electric, Photoswitch, and others) or can be constructed from a variety of standard circuit diagrams (*2*). Beyond the control reservoir is a micrometer valve (Norgren) that regulates the infusion rate. Tygon tubing is used throughout, and the portion that is accessible to the animal is protected by BX armor. A glass blower's swivel is used to permit unlimited movement of the animal in the cage without twisting the tubing. The swivel is supported by a counterbalance weight so that no excess tubing is in the cage, regardless of the position of the animal. The entire apparatus costs about $70.

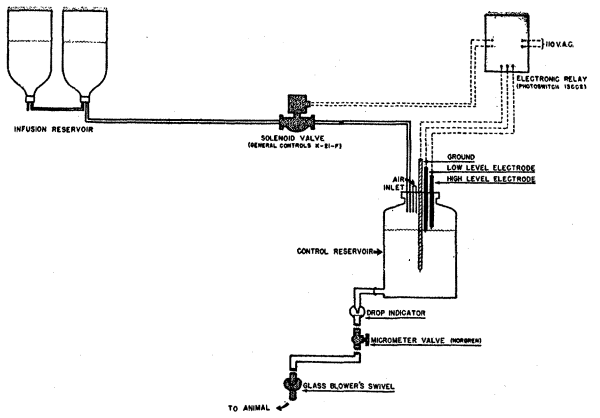

Fig. 1. Diagram of constant infusion apparatus.

This apparatus was successfully employed to perfuse the portal vein of an unanesthetized, unrestrained dog for 45 days. It is felt that the method has a variety of experimental applications.

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14 March 1955.

Calendar for Estimating Intervals in Days

Harris (*1*) has described a two-dimensional slide rule for the rapid calculation of time and other intervals. Table 1 shows, in a single chart, "days elapsed" and "days remaining" of the counting-house calendars commonly shown in diaries and desk calendars, together with multiples of 365. These data provide for the ready calculation of time intervals in days within

Table 1. Section of a counting house calendar for estimating intervals in days (*3*).

Jan.	Feb.	Mar.	Apr.	May	June
1 364	32 333	60 305	91 274	121 244	152 213
2 363	33 332	61 304	92 273	122 243	153 212
3 362	34 331	62 303	93 272	123 242	154 211
4 361	35 330	63 302	94 271	124 241	155 210
5 360	36 329	64 301	95 270	125 240	156 209
6 359	37 328	65 300	96 269	126 239	157 208
7 358	38 327	66 299	97 268	127 238	158 207

July	Aug.	Sept.	Oct.	Nov.	Dec.
182 183	213 152	244 121	274 91	305 60	335 30
183 182	214 151	245 120	275 90	306 59	336 29
184 181	215 150	246 119	276 89	307 58	337 29
185 180	216 149	247 118	277 88	308 57	338 27
186 179	217 148	248 117	278 87	309 56	339 26
187 178	218 147	249 116	279 86	310 55	340 25
188 177	219 146	250 115	280 85	311 54	341 24

a year or extending over several years (*2*). Thus, for calculating, on 30 Jan. 1955, the age of an animal born 28 Dec. 1951, the following data are summed:

Days remaining 1951	3
Days for 3 intervening years	1095
29 Feb. 1952	1
Days elapsed 1954	30
Age in days	1129

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References and Notes

1. M. R. Harris, *Science* **118**, 309 (1953).
2. Developed in connection with a study supported by the American Cancer Society.
3. Copies of the calendar, within reasonable limits, can be obtained from G. J. Cox.

10 March 1955.

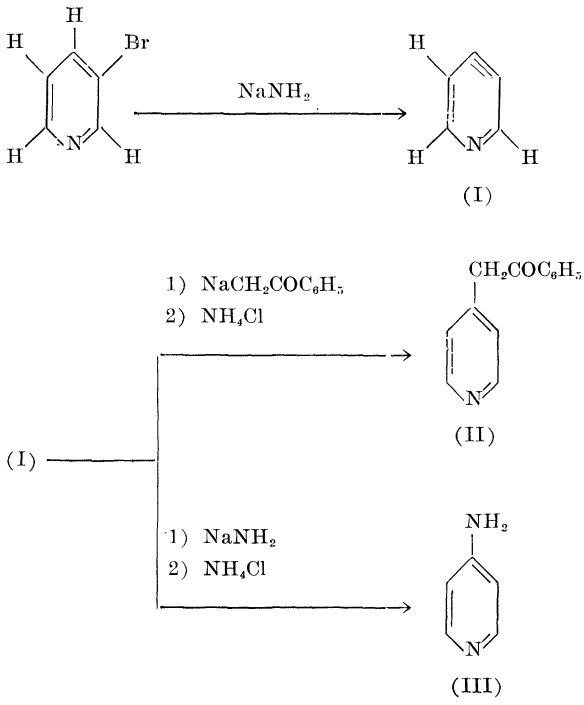
Rearrangement in the Reaction of 3-Bromopyridine with Sodium Amide and Sodioacetophenone

In connection with an extensive study of the chemistry of the tar bases and their derivatives, we have investigated the reaction of sodioacetophenone with 3-bromopyridine as a possible route to the unknown 3-phenacylpyridine.

From the attempted reaction of equivalents of 3-bromopyridine and sodioacetophenone—prepared from the ketone and sodium amide—in refluxing toluene, only the starting materials were isolated.

However, on processing a reaction mixture that was obtained by adding a liquid ammonia suspension of two equivalents of sodium amide to a liquid ammonia suspension of a mixture of one equivalent each of 3-bromopyridine and sodioacetophenone, there was isolated, in addition to a large amount of amorphous nitrogenous material, 13.5 percent of 4-phenacylpyridine (II), mp 112.6 to 113.6° (*1*) (from 60° to 70° petroleum ether) alone and when mixed with an authentic sample, and 10.0 percent of 4-aminopyridine (III), mp 157 to 158.4° (*2*) from benzene) [N-benzoyl derivative, mp 207° (from hot water). Analysis calculated for $C_{12}H_{10}N_2O$, N, 14.14; found, 14.20].

The formation of these compounds (II and III) may be rationalized by assuming an elimination-addition mechanism involving the transient existence of a "pyridyne" intermediate analogous to the "benzyne" postulated earlier by Roberts *et al.* (*3*) in the rearrangement of chlorobenzene-1-C^{14} when treated with potassium amide.



Further work is now in progress in this laboratory to determine the scope and limitations of this and related reactions.

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3. J. D. Roberts *et al.*, *J. Am. Chem. Soc.* **75**, 3290 (1953).
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